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PART IV:

ENVIRONMENTAL PROTECTION AGENCY

■

HAZARDOUS SUBSTANCES

Designation, Removability, Harmful Quantities, Penalty Rates

ENVIRONMENTAL PROTECTION AGENCY
(FRL 471-7)
[40 CFR Part 116]

DESIGNATION OF HAZARDOUS SUBSTANCES

Notice of Proposed Rulemaking

Notice is hereby given in accordance with 5 U.S.C. 553 that the Administrator, Environmental Protection Agency, under authority contained in Section 311(b)(2)(A) of the Federal Water Pollution Control Act Amendments of 1972 [33 U.S.C. 1251 et seq., (the Act)] proposes a new Part 116.

The Federal Water Pollution Control Act Amendments of 1972 (P.L. 92-500) amended the Federal Water Pollution Control Act (33 U.S.C. 1151 et seq.) to add a new Section 311, which provides in Subsection (b)(2)(A) as follows:

> "The Administrator shall develop, promulgate, and revise as may be appropriate, regulations designating as hazardous substances, other than oil as defined in this section, such elements and compounds which, when discharged in any quantity into or upon the navigable waters of the United States or adjoining shorelines or the waters of the contiguous zone, present an imminent and substantial danger to the public health or welfare, including, but not limited to, fish, shellfish, wildlife, shorelines, and beaches."

This notice proposes such a designation of hazardous substances.

Section 311(b)(2)(B)(i) and 311(b)(4) of the Act require a determination of actual removability and harmful quantity respectively for each designated substance. In addition, Section 311(b)(2)(B)(iv) of the Act requires the establishment of penalty rates for all substances judged to be not actually removable from the water. These other regulations are proposed concurrently as 40 CFR Parts 117, 118, and 119 respectively.

The designation of hazardous substances provides the foundation for the regulation of discharges of substances other than oil as provided for in Section 311. Remaining regulations and activities required to fully implement the hazardous substances provisions of Section 311 are as follows:

- Fixing limitations of removal liability for small facilities [Section 311(f)(2)].
- Determination of methods of removability [Section 311(j)(1)(A)].
- Development of discharge prevention procedures [Section 311(j)(1)(C)].
- Determination of quantities which are not harmful [Section 311(b)(3)].
- Revision of the National Oil and Hazardous Material Pollution Contingency Plan [Section 311(c)(2)].

On August 22, 1974, after completion of studies and conferences dating from 1970, the Assistant Administrator for Water and Hazardous Materials published an Advance Notice of Proposed Rulemaking for the designation of hazardous substances and the determination of their removability (Federal Register, Vol. 39, No. 164, Part IV, pp. 30466-30471). Included in that publication were: (1) tentative selection criteria used to quantitatively describe the concept of "... imminent and substantial danger to public health or welfare..."; (2) factors considered in the determination of actual removability; (3) a list of substances under consideration; (4) a tentative determination of removability; and (5) a request for data

and comments on both specific and general aspects of the action. In response to the Advance Notice, 84 written comments were received and considered in the development of the proposed rule set forth herein. Comments primarily concerned selection criteria, substances to be deleted or added, spill potential, toxicity information, potential conflict between discharges regulated under Section 311 and those regulated under other sections of the Act, and the term "research quantities".

A. Toxicological Selection Criteria

Tentative selection criteria set forth in the August 22, 1974, Advance Notice were as follows:

> "1. Any element or compound produced in excess of research quantities possesses sufficient danger potential to be considered as a candidate hazardous substance if it is lethal to: (a) One-half of a test population of aquatic animals in 96 hours or less at a concentration of 500 milligrams per liter (mg/l) or less; or (b) one-half of a test population of animals in 14 days or less when administered as a single oral dose equal to or less than 50 milligrams per kilogram (mg/kg) of body weight; or (c) one-half of a test population of animals in 14 days or less when dermally exposed to an amount equal to or less than 200 mg/kg body weight for 24 hours; or (d) one-half of a test population of animals in 14 days or less when exposed to a vapor concentration equal to or less than 200 cubic centimeters per cubic meter (volume/volume) in air for one hour; or (e) aquatic flora as measured by a 50 percent decrease in cell count, biomass, or photosynthetic ability in 14 days or less at concentrations equal to or less than 100 mg/l.
> 2. To be further considered for designation as a hazardous substance, any element or compound meeting the above criteria must have a reasonable potential for being discharged; i.e., spilled into a water body. Factors being considered in making this evaluation include the production quantities, modes of transportation, handling and storing practices, past spill experience, and physical/chemical properties of each substance."

Selection criteria were employed and are proposed to be used because it was recognized that virtually every substance has the potential for presenting some danger to public health or welfare depending upon the

quantity of substance discharged, and the time, location, and conditions of the discharge. In order to limit the designation to those substances which could reasonably be anticipated to present an imminent and substantial danger to public health or welfare, the above criteria were applied.

Of the toxicological criteria initially proposed in the Advance Notice, there was minimal objection to the use of the "highly toxic" classification as a limitation for selecting substances based on mammalian test data. The highly toxic classification has been adopted by the Environmental Protection Agency as may be found in Federal Register, Vol. 40, No. 129, Part II, pp. 28242-28286, July 3, 1975.

According to the reference cited above, substances which have an oral LD50 of 50 mg/kg of body weight or less, have a dermal LD50 of 200 mg/kg of body weight or less, or have an inhalation LC50 of 20 cubic centimeters per cubic meter of vapor in air or less, are defined as highly toxic to mammals. The term "oral LD50" means that single oral dose which is lethal to one-half of the test population in 14 days. The term "dermal LD50" means that dose dermally absorbed in 24 hours which is lethal to one-half of the test population in 14 days. The term "inhalation LC50" means that concentration of gas or vapor which, upon exposure for one hour, is lethal to one-half of the test population in 14 days.

A change in the "inhalation LC50" value should be noted. The August 22, 1974, Advance Notice of Proposed Rulemaking stated this criterion as lethality to one-half of a test population of animals within

14 days of exposure to a vapor concentration "... equal to or less than 200 cubic centimeters per cubic meter (volume/volume) of air for one hour..." This criterion paralleled the "highly toxic" category adopted by EPA in 40 CFR Part 162.8. The criterion has recently (July 3, 1975) been amended by publication of 40 Federal Register p. 28242, which reduces the cutoff to 20 cubic centimeters per cubic meter of air. For consistency, a corresponding change has been made in this proposed rule. (No change need be made in the current list of materials since none happens to have been designated under the "inhalation LC50" criterion.)

The criterion receiving the greatest number of adverse comments was that pertaining to aquatic animal toxicity which proposed a selection limit of 500 mg/l based on LC50 bioassay data. The term "LC50" means that concentration which is lethal to one-half of a test population of aquatic animals upon continuous exposure for a given period of time, usually 96 hours. The concept of utilizing acute bioassay data was generally supported. However, many commenters expressed the belief that the limitation was either too restrictive or too permissive, with suggested limitation values ranging between 1.0 and 5,000 mg/l.

A common suggestion was that the selection limit be lowered to 100 mg/l. In support of this suggested limit, comments indicated that a hazard ranking system has classified substances with aquatic LC50 values of 100-1,000 mg/l as "practically non-toxic". This system is being considered by governments ratifying the International Convention for the Prevention of Pollution from Ships, 1973, sponsored by the

Intergovernmental Maritime Consultative Organization (IMCO). However, the IMCO system was originally designed for application to tank cleaning and operational discharges from ships at sea beyond the territorial limits, rather than to discharges to the inland waters and the territorial seas. Even though substances with LC50 values of 100 to 1,000 mg/l have been classified as "practically non-toxic", the IMCO system does require some level of control over the discharge of these substances even in waters beyond the territorial seas.

Furthermore, the Agency has evaluated recent fish kill reports in which the causative agent was identified. Twenty-two of the proposed elements and compounds were reported as the causative agent in recent fish kills. Of these, seven have 96 hour LC50 values greater than 100 mg/l. None has an LC50 value consistently greater than 500 mg/l. Thus, a reduction of the aquatic toxicity selection limit to 100 mg/l would result in the deletion of 7 substances which have caused environmental damage. Even though the data used in this analysis are recognized as being less than comprehensive, the significance in lowering this selection criterion would be the elimination of materials such as sulfuric acid, hydrochloric acid, and other materials which have caused fish kills.

In this proposed rulemaking, the aquatic toxicity selection limit of 500 mg/l is maintained. This is done in the belief that it is both appropriate and responsive to the requirement of Section 311 to identify those substances which may present an imminent and substantial danger to the public health or welfare when discharged into navigable waters.

The selection criterion dealing with phytotoxicity was questioned because few data are available which are consistent with the test method specified in the selection criterion. Although no substance is currently listed because of its phytotoxic action, the criterion is maintained to permit future addition of substances which may be detrimental to this important segment of the aquatic environment.

Selection criteria based on effects such as teratogenicity, mutagenicity, carcinogenicity, and bioaccumulation were suggested and have been considered. Typically, these effects have been noted after lengthy or lifetime exposure of test populations to the test material. These data do not, at this time, provide a basis for regulation of acute discharges of such materials. Although the proposed selection criteria do not include consideration of such effects at this time, the Agency intends to keep the relationship of Section 311 to these concerns under continuing review.

Radioactive materials are not included in this proposed rulemaking but may be considered as candidates for designation in the future should sufficient need and information warrant their inclusion.

B. Deletions

In response to the Advance Notice of Proposed Rulemaking, comments requesting the deletion of specific materials were submitted and evaluated. Where accompanied by appropriate supportive data documenting effects not in accordance with the proposed selection criteria, certain materials have been deleted from this proposed list. These materials are:

Ammonium sulfate	Sodium borate
Boric acid	Sodium cacodylate
Cacodylic acid	Sodium silicate

Those comments requesting specific substances be added lacked supporting data of the type and extent necessary to justify expansion of the proposed list at this time. Section 311(b)(2)(A) provides the authority to revise any promulgated designation as may be appropriate. Those substances suggested for addition may be considered along with others at a future date.

C. Potential for Discharge

In regard to the second part of the proposed selection criteria, that dealing with the potential for discharge, several comments requesting clarification were received. The Agency has reexamined the factors listed in the Advance Notice and proposes certain changes.

As set forth in the Advance Notice, the initial screening criterion concerned production of proposed substances in excess of research quantities. It now appears that the question of research quantity is more appropriately viewed as a factor to be utilized in the overall evaluation of spill potential rather than an independent decision point. Difficulty is encountered in identifying a single, specific production quantity indicative of large volume commercial usage versus exclusively research-related use. Consequently, the question of research quantity is now addressed in terms of uses rather than in terms of a specific production volume.

Few data are available concerning the mode of transportation and handling and storage practices of many substances. Therefore, these considerations are no longer included in the assessment of potential for discharge. Factors currently proposed in determining spill potential are:

1. Past history of spillage
2. Production quantity
3. Use and distribution patterns
4. Value of the substance

Candidate substances which meet at least one lethality criterion are further examined for documented evidence of having been discharged in a spill situation. Those substances having a previous history of spillage are maintained as proposed hazardous substances. Because the reporting of spills of substances other than oil is not yet required, it can be concluded that the spillage of many substances has gone unreported. Consequently, those spills presently recorded do not fully represent the magnitude of the problem nor are they an inclusive representation of all substances which have a reasonable potential for discharge.

In evaluating the list of potentially hazardous chemicals, it was realized that a higher probability of a discharge exists for some materials than for others. This is reflected to some extent by reports maintained by the Department of Transportation and the Environmental Protection Agency. These records show that the materials spilled most frequently are, in general, the ones that are most abundant in commerce. That is, a distinction may be made between heavy usage bulk chemicals

and other less widely used and distributed chemicals. An analysis of production quantities, usage, and selling price indicates that chemicals produced in excess of one billion pounds annually are commonly used in highly diversified products and processes. As such, they are handled and transported in large quantities. Such chemicals also have a typically low selling price. Accordingly, candidate substances produced in excess of one billion pounds per year are judged to have a relatively high spill potential and are proposed for designation as hazardous substances.

Materials which are produced in quantities less than one billion pounds annually or for which annual production is not known, are further examined for use and distribution patterns, and unit price. Substances with usages limited to research, medicinals, food additives, or analytical reagents are not further considered for designation at this time. These materials are subject to limited production and bulk storage and transport. It is further noted that such substances are generally of high purity and as such are subject to careful handling and have a high selling price. Such substances are believed to pose only limited potential for spillage.

Substances having a high commercial market value are considered to pose a limited spill risk. Additional safeguards in the manufacture, handling, and processing of such valuable substances apparently minimize the possibility of spillage.

Because of their intentional use and distribution in the environment, chemicals used primarily as pesticides are believed to have a high prob-

ability of discharge to the water and are maintained as proposed hazardous substances regardless of production volume or selling price.

As an example of a material proposed for designation, sulfuric acid is the highest volume product in the chemical industry with 59 billion pounds produced in 1971. As a workhorse of industry, its production and use are steadily increasing. Department of Transportation and Environmental Protection Agency records show a continual increase in accidents involving sulfuric acid through the years 1971, 1972, and 1973. The low cost of the material, the large number of manufacturers and distributors, and high production and transportation volume are apparent contributive factors to the high spill frequency. Since toxicological properties are in accordance with proposed selection criteria, sulfuric acid is proposed for designation as a hazardous substance.

An example of a material not proposed as a hazardous substance because of low spill potential is ammonium gluconate. This compound was tentatively included in the Advance Notice list because of toxic properties of the ammonium ion. Subsequent analysis reveals that production figures are not available, the chemical has only limited distribution and use as an emulsifier in the food industry, and no record of past spillage. The analysis indicates low spill potential and the substance is no longer considered for designation.

Other substances listed in the Advance Notice and below appear to have little probability for discharge and are deleted because of one or more of the following factors:

1. No history of spill discharge
2. Low production quantity
3. Limited commercial use and distribution
4. High value of the substance

D. Materials Deleted Because of Low Potential for Discharge

Ammonium Ferrocyanide
Ammonium Formate
Ammonium Gluconate
Ammonium Molybdate
Antimony Triiodide
Arsenic Tribromide
Arsenic Trifluoride
Arsenic Triiodide
Beryllium Hydroxide
Beryllium Phosphate
Beryllium Sulfate
Brucine
Cadmium Fluoborate
Cadmium Nitrate
Cadmium Sulfate
Catechol
Chromous Carbonate
Chromous Oxalate
Cobaltous Acetate
Cobaltous Chloride
Cobaltous Citrate
Cobaltous Iodide
Cobaltous Nitrate
Cobaltous Perchlorate
Cobaltous Succinate
Cobaltous Sulfate
Cupric Acetylacetonate
Cupric Bromide
Cupric Gluconate
Cuprous Iodide
Ferric Glycerophosphate
Ferric Phosphate
Ferrous Oxalate
Hydroquinone
Lead Bromide
Lithium Fluoride
Mercuric Ammonium Chloride
Mercuric Bromide
Mercuric Chloride
Mercuric Iodide
Mercuric Oxide
Mercurous Chloride
Mercurous Iodide

Molybdic Trioxide	Selenic Acid
Nickel Acetate	Selenium Oxychloride
Nickel Bromide	Tannic Acid
Nickel Fluoride	Vanadium Oxytrichloride
Nickel Iodide	Zinc Ammonium Sulfate
Nickel Perchlorate	Zinc Permanganate
Phosphorous Pentafluoride	Zinc Propionate
Pyrogallic Acid	Zirconium Ammonium Fluoride

In summary, the proposed selection criteria for hazardous substances are as follows: any element, compound, or mixture thereof, possesses sufficient danger potential to be designated as a hazardous substance, if it is lethal to:

(a) One-half of a test population of aquatic animals in 96 hours or less at a concentration of 500 milligrams per liter (mg/l) or less; or

(b) One-half of a test population of animals in 14 days or less when administered as a single oral dose equal to or less than 50 milligrams per kilogram (mg/kg) of body weight; or

(c) One-half of a test population of animals in 14 days or less when dermally exposed to an amount equal to or less than 200 mg/kg of body weight for 24 hours; or

(d) One-half of a test population of animals in 14 days or less when exposed to a vapor concentration equal to or less than 20 cubic centimeters per cubic meter (volume/volume) in air for one hour; or

(e) Aquatic flora as measured by a 50% decrease in cell count, biomass, or photosynthetic ability in 14 days or less at concentrations equal to or less than 100 milligrams per liter (mg/l).

In addition to meeting one or more of the above acute lethality criteria, a candidate substance must have a reasonable potential for being discharged. Factors considered in making this evaluation include 1) past spill history, 2) production quantity, 3) use and distribution patterns, and 4) value of the substance.

E. Applicability

In considering the applicability of the proposed rules, the Advance Notice stated:

> "It is important to note that not all discharges of substances designated as hazardous will be subject to the enforcement provisions of Section 311. Because Section 311 applies only to discharges from vessels or facilities, a designation regulation would not apply to discharges from other sources such as agricultural land runoff, or irrigation return flows. The discharges being considered can be placed in two separate categories. The first relates to transportation and storage incidents in which there is normally no release of the substance except in the spill situation. The second relates to industrial production facilities in which a designated hazardous substance is released in quantities exceeding those of a permitted normally operating effluent. Periodic or continuous discharges are regulated under other provisions of the Act. Accordingly, the Agency is considering that the regulation would exclude from designation discharges of hazardous substances which are made: (a) In compliance with effluent limitations or guidelines established under Sections 301, 302, 304, 306, and 307 of the Act; (b) in quantities not exceeding those identified for such substances in an application for an NPDES permit which has been issued pursuant to Section 402 of the Act; (c) in compliance with permits issued under Section 404 of the Act or Sections 102 and 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1401 et seq.); (d) from properly functioning marine sanitation flow-through devices certified by the United States Coast Guard pursuant to Section 312 of the Act; or (e) in the course of a permitted use of a pesticide registered under the Federal Insecticide,

Fungicide, and Rodenticide Act (7 U.S.C. Sections 136 and through 136y)."

Although most comments agreed with the general purpose, the exclusions are now considered more appropriate to the proposed rules concerning harmful quantities (proposed 40 CFR Part 118) and rates of penalty (proposed 40 CFR Part 119) to be published concurrently. The intent is not the exclusion of substances from designation, but rather the exclusion of certain discharges permitted under other sections of the Act or other authorities from notification requirements and penalty provisions of Section 311. This will allow use of revolving funds [Section 311(k)] to be used for discharges of any designated hazardous substance. Consequently, applicability of this proposed rule may be stated as follows:

> The elements and compounds, or mixtures thereof, appearing on the following list are designated as hazardous substances if discharged into navigable waters or adjoining shorelines, or into the waters of the contiguous zone from vessels, onshore facilities or offshore facilities.

Interested persons may participate in this rulemaking by submitting written comments or requests for information in triplicate to: Dr. C. Hugh Thompson, Chief, Hazardous Substances Branch, Criteria and Standards Division, Office of Water Planning and Standards, WH-595, Environmental Protection Agency, Washington, D.C. 20460.

Copies of all public comments will be available for inspection and copying at the U.S. Environmental Protection Agency, Public Information Reference Unit, Room 2922 (EPA Library), 401 M St., S.W., Washington, D.C. 20460. The Environmental Protection Agency information regulation, 40 CFR Part 2 provides that a reasonable fee may be charged for copying.

All comments received on or before 60 calendar days after the date of this publication will be considered.

Executive Order 11821 (November 27, 1974) requires that major proposals for legislation and promulgation of regulations and rules by agencies of the Executive Branch be accompanied by a statement certifying that the inflationary impact of the proposal has been evaluated.

A number of criteria have been defined to determine which actions require an inflationary impact statement. The Agency's analysis of the potential economic impact of these regulations indicate that none of the criteria defining a major proposal have been met. Thus, it is hereby certified that the economic and inflationary effects of this proposal have been carefully evaluated in accordance with Executive Order 11821 and that no inflationary impact statement is required.

Russell E. Train
Administrator

Dated: DEC 2 [illegible] 1975

Certified [illegible] original

Part 116 - DESIGNATION OF HAZARDOUS SUBSTANCES

116.1 Applicability

116.2 Abbreviations

116.3 Definitions

116.4 Designation of Hazardous Substances

Authority: Sections 311(b)(2)(A) and 501(a) of the Federal Water Pollution Control Act Amendments of 1972 (33 U.S.C. 1251 et seq.).

116.1 APPLICABILITY

The regulation of this part designates hazardous substances under Section 311(b)(2)(A) of the Act. The proposed regulation applies to discharges of substances designated herein into navigable waters or adjoining shorelines or the waters of the contiguous zone from vessels and onshore and offshore facilities.

116.2 ABBREVIATIONS

ppm = parts per million

mg = milligram(s)

kg = kilogram(s)

mg/l = milligram(s) per liter

mg/kg = milligram(s) per kilogram

116.3 DEFINITIONS

As used in this part, all terms shall have the meaning defined in the Act and as given below.

"The Act" means the Federal Water Pollution Control Act, as amended by the Federal Water Pollution Control Act Amendments of 1972, (P.L. 92-500, 33 U.S.C. 1251 et seq.);

"Vessel" means every description of watercraft or other artificial contrivance used, or capable of being used, as a means of transportation on water other than a public vessel;

"Onshore facility" means any facility (including, but not limited to, motor vehicles and rolling stock) of any kind located in, on, or under, any land within the United States other than submerged land;

"Offshore facility" means any facility of any kind located in, on, or under, any of the navigable waters of the United States other than a vessel or a public vessel;

"Navigable waters" shall have the same meaning as it has in Section 502(7) of the Act, and includes: (1) all navigable waters of the United States; (2) tributaries of navigable waters of the United States; (3) interstate waters; (4) intrastate lakes, rivers and streams which are utilized by interstate travelers for recreational and other purposes; (5) intrastate lakes, rivers and streams from which fish or shellfish are taken and sold in interstate commerce; and (6) intrastate lakes, rivers, and streams which are utilized for industrial purposes by industries in interstate commerce;

"Contiguous zone" means the entire zone established or to be established by the United States under article 24 of the Convention of the Territorial Sea and the Contiguous Zone;

"Territorial seas" means the belt of the seas measured from the line of ordinary low water along that portion of the coast which is in direct contact with the open sea and the line marking the seaward limit of inland waters, and extending seaward a distance of three miles;

"Aquatic animals" means appropriately sensitive wholly aquatic animals which carry out respiration by means of a gill structure permitting gaseous exchange between the water and the circulatory system;

"Animals" means appropriately sensitive animals which carry out respiration by means of a lung structure permitting gaseous exchange between air and the circulatory system;

"Aquatic flora" means plant life associated with the aquatic ecosystem including, but not limited to, algae and higher plants;

"Mixture" means any combination of two or more elements and/or compounds in solid, liquid or gaseous form.

116.4 DESIGNATION OF HAZARDOUS SUBSTANCES

The following criteria were employed in the derivation of the list and may be used in any future revisions thereof.

Any element or compound or structural isomer which is lethal to:

(a) one-half of a test population of aquatic animals in 96 hours or less at a concentration of 500 mg/l (ppm) or less; or

(b) one-half of a test population of animals in 14 days when administered as a single oral dose equal to or less than 50 mg/kg of body weight; or

(c) one-half of a test population of animals in 14 days when dermally exposed to an amount equal to or less than 200 mg/kg of body weight for 24 hours; or

(d) one-half of a test population of animals in 14 days or less when exposed to a vapor concentration equal to or less than 20 cubic centimeters per cubic meter of air for one hour; or

(e) aquatic flora as measured by a 50% decrease in cell count, biomass, or photosynthetic ability in 14 days or less at concentrations equal to or less than 100 mg/l (ppm);

is a candidate for designation as a hazardous substance.

After satisfying the toxicity screen a determination is made that the candidate material has a reasonable potential for discharge as determined by: 1) past record of discharge; 2) production volume; 3) use and distribution patterns; and 4) selling price; and is therefore proposed as a hazardous substance.

The elements, compounds or their structural isomers, or mixtures thereof, appearing on the following Table 116.4, are designated as hazardous substances if discharged into navigable waters or adjoining shorelines or into the waters of the contiguous zone from vessels, onshore facilities or offshore facilities.

TABLE 116.4 LIST OF HAZARDOUS SUBSTANCES

The substances which are indented in the left hand column of the following list are designated as hazardous substances on the basis of toxicological properties of one component ion or group. Toxicological criteria met by each substance are denoted by the number on the left of the common name according to the following key:

1 = aquatic animal toxicity
2 = oral mammalian toxicity
3 = dermal mammalian toxicity
4 = inhalation mammalian toxicity
5 = phytotoxicity

The underlined headings in the list are provided only for ease of referencing and are not designated hazardous substances; e.g., Fluorine compounds does not mean that all fluorine compounds are designated as hazardous substances.

	COMMON NAME	SYNONYMS	ISOMERS
1	Acetaldehyde	ethanal ethyl aldehyde aldehyde acetic aldehyde	
1	Acetic acid	glacial acetic acid vinegar acid	
1	Acetic anhydride	acetic oxide acetyl oxide	
2	Acetone cyanohydrin	2-methyllactonitrile alpha-hydroxyisobutyronitrile	
1	Acetyl bromide		
1	Acetyl chloride		
1, 2	Acrolein	2-propenal acrylic aldehyde acrylaldehyde acraldehyde	
1	Acrylonitrile	cyanoethylene Fumigrain Ventox propenenitrile vinyl cyanide	
2	Adiponitrile	1, 4-dicyanobutane	
1	Aldrin	Octalene HHDN	
1	Allyl alcohol	2-propen-1-ol 1-propenol-3 vinyl carbinol	
1	Allyl chloride	3-chloropropene 3-chloropropylene Chlorallylene	
1	Aluminum sulfate	alum	
1	Ammonia		

	COMMON NAME	SYNONYMS	ISOMERS
	Ammonium compounds		
1	Ammonium acetate	acetic acid ammonium salt	
1	Ammonium benzoate		
1	Ammonium bicarbonate	acid ammonium carbonate ammonium hydrogen carbonate	
1	Ammonium bisulfite		
1	Ammonium bromide		
1	Ammonium carbamate	ammonium aminoformate	
1	Ammonium carbonate		
1	Ammonium chloride	ammonium muriate sal ammoniac salmiac Amchlor	
1	Ammonium citrate, dibasic	diammonium citrate citric acid diammonium salt	
1	Ammonium fluoborate		
1	Ammonium hydroxide		
1	Ammonium hypophosphite		
1	Ammonium iodide		
1	Ammonium nitrate		
1	Ammonium oxalate		
1	Ammonium pentaborate	ammonium decaborate	
1	Ammonium persulfate	ammonium peroxydisulfate	
1	Ammonium silicofluoride	ammonium fluosilicate	
1	Ammonium sulfamate	Ammate AMS ammonium amidosulfate	
1	Ammonium sulfide		
1	Ammonium sulfite		
1	Ammonium tartrate	tartaric acid ammonium salt	
1	Ammonium thiocyanate	ammonium rhodanide ammonium sulfocyanate ammonium sulfocyanide	
1	Ammonium thiosulfate	ammonium hyposulfite	
1	Amyl acetate	amylacetic ester pear oil banana oil	normal-; iso-; secondary-; tertiary- amyl acetate
1	Aniline	aniline oil phenylamine aminobenzene aminophen kyanol	

	COMMON NAME	SYNONYMS	ISOMERS
	Antimony compounds		
1	Antimony pentachloride		
1	Antimony pentafluoride		
1	Antimony potassium tartrate	tartar emetic tartrated antimony tartarized antimony potassium antimonyltartrate	
1	Antimony tribromide		
1	Antimony trichloride	butter of antimony	
1	Antimony trifluoride	antimony fluoride	
1	Antimony trioxide	diantimony trioxide flowers of antimony	
	Arsenic compounds		
1, 3	Arsenic acid	orthoarsenic acid	
1	Arsenic disulfide	arsenic monosulfide red arsenic sulfide	
1, 2	Arsenic pentaoxide	arsenic acid anhydride arsenic oxide	
1	Arsenic trichloride	arsenic chloride arsenious chloride arsenous chloride butter of arsenic	
1, 2	Arsenic trioxide	arsenious acid arsenious oxide white arsenic	
1	Arsenic trisulfide	arsenious sulfide yellow arsenic sulfide	
1	Calcium arsenate	tricalcium ortho-arsenate	
1	Calcium arsenite		
1	Potassium arsenate		
1	Potassium arsenite	potassium metaarsenite	
1	Sodium arsenate	disodium arsenate	
1, 2	Sodium arsenite	sodium metaarsenite	
1	Benzene	cyclohexatriene benzol	
1	Benzoic acid	benzenecarboxylic acid phenylformic acid dracylic acid	
1, 3	Benzonitrile	phenyl cyanide cyanobenzene	
1	Benzoyl chloride	benzenecarbonyl chloride	
1	Benzyl chloride		

	COMMON NAME	SYNONYMS	ISOMERS
	Beryllium compounds		
1	Beryllium chloride		
1, 2	Beryllium fluoride		
1, 3	Beryllium nitrate		
1, 2	Butyl acetate	acetic acid normal-butyl ester acetic acid secondary-butyl ester acetic acid iso-butyl ester acetic acid tertiary-butyl ester	normal-; secondary-; iso-; tertiary-butyl acetate
1	Butylamine	1-; 2-aminobutane 2-amino-2-methylpropane 1-amino-2-methylpropane	normal-; secondary-; tertiary-butylamine
1	Butyric acid	butanoic acid ethylacetic acid	normal-; iso-butyric acid
	Cadmium compounds		
1	Cadmium acetate		
1	Cadmium bromide		
1	Cadmium chloride		
1	Calcium carbide	carbide acetylenogen	
1	Calcium hydroxide	lime, hydrated slaked lime calcium hydrate	
1	Calcium hypochlorite		
1	Calcium oxide	lime quicklime	
1, 2	Captan	Orthocide-406 SR-406 Vancide-89	
1	Carbaryl	Sevin	
1	Carbon disulfide	carbon bisulfide dithiocarbonic anhydride	
1	Chlordane	Toxichlor	
1	Chlorine		

	COMMON NAME	SYNONYMS	ISOMERS
1	Chlorobenzene	monochlorobenzene benzene chloride	
1	Chloroform	trichloromethane	
1	Chlorosulfonic acid	sulfuric chlorohydrin	
	Chromium compounds		
1	Ammonium bichromate	ammonium dichromate	
1	Ammonium chromate		
1, 2	Calcium chromate	calcium chrome yellow gelbin yellow ultramarine	
3	Chromic acetate		
1	Chromic acid	chromic anhydride chromium trioxide	
1	Chromic sulfate		
1	Chromous chloride		
1	Chromyl chloride	chromium dioxychloride	
1	Lithium bichromate	lithium dichromate	
1	Lithium chromate		
1	Potassium bichromate	potassium dichromate	
1	Potassium chromate		
1	Sodium bichromate	sodium dichromate	
1	Sodium chromate		
1	Strontium chromate		
1	Zinc bichromate	zinc dichromate	
	Cobalt compounds		
1	Cobaltous bromide	cobalt bromide	
1	Cobaltous fluoride	cobalt fluoride	
1	Cobaltous formate	cobalt formate	
1	Cobaltous sulfamate	cobalt sulfamate	
	Copper compounds		
1	Cupric acetate	copper acetate crystallized verdigris	
1, 2	Cupric acetoarsenite	copper acetoarsenite copper acetate arsenite Paris green	
1	Cupric chloride	copper chloride	
1	Cupric formate	copper formate	
1	Cupric glycinate	copper glycinate cupric aminoacetate	
1	Cupric lactate	copper lactate	
1	Cupric nitrate	copper nitrate	
1	Cupric oxalate	copper oxalate	
1	Cupric subacetate	basic copper acetate	
1	Cupric sulfate	copper sulfate	
1	Cupric sulfate, ammoniated	ammoniated copper sulfate	

	COMMON NAME	SYNONYMS	ISOMERS
1	Cupric tartrate	copper tartrate	
1	Cuprous bromide	copper bromide	
1, 2	Coumaphos	Co-Ral	
1	Cresol	cresylic acid hydroxytoluene	meta-;ortho-; para-cresol
	Cyanide compounds		
1	Barium cyanide		
1	Calcium cyanide		
1, 2	Hydrogen cyanide	hydrocyanic acid	
1, 2	Potassium cyanide		
1, 2	Sodium cyanide		
1	Zinc cyanide		
1	Cyanogen chloride		
1	Cyclohexane	hexahydrobenzene hexamethylene hexanaphthene	
1	2, 4-D (acid)	2, 4-dichlorophenoxyacetic acid	
1	2, 4-D (esters)	2, 4-dichlorophenoxyacetic acid esters	
1	Dalapon	Dowpon Gramevin Radapon Unipon	
1	DDT	p, p'-DDT	
1	Diazinon	Dipofene Diazitol Basudin Spectracide	
1	Dicamba	2-methoxy-3, 6-dichlorobenzoic acid	
1	Dichlobenil	2, 6-dichlorobenzonitrile 2, 6-DBN	
1	Dichlone	Phygon dichloronaphthoquinone	
1	Dichlorvos	2, 2-dichlorovinyl dimethyl phosphate Vapona	
1	Dieldrin	Alvit	
1	Diethylamine		

	COMMON NAME	SYNONYMS	ISOMERS
1	Dimethylamine		
1	Dinitrobenzene	dinitrobenzol	
1, 2	Dinitrophenol	Aldifen	2, 3-; 2, 4-; 2, 5-; 2, 6; 3, 4-; 3, 5-dinitrophenol
1	Diquat	Aquacide Dextrone Reglone Diquat dibromide	
1, 2	Disulfoton	Di-syston	
1	Diuron	DCMU DMU	
1	Dodecylbenzenesulfonic acid		
1	Dodecylbenzenesulfonic acid, calcium salt		
1	Dodecylbenzenesulfonic acid, isopropanolamine salt		
1	Dodecylbenzenesulfonic acid, sodium salt		
1	Dodecylbenzenesulfonic acid, triethanolamine salt		
1	Dursban	chlorpyrifos	
1	Endosulfan	Thiodan	
1, 2	Endrin	Mendrin Compound 269	
1, 2	Ethion	Nialate	
1	Ethylbenzene		
1	Ethylenediamine	1, 2-diaminoethane	
1	Ethylenediamine-tetraacetic acid	EDTA edetic acid Havidote (ethylenedinitrilo)-tetraacetic acid	
	Fluorine compounds		
1	Aluminum fluoride	aluminum trifluoride	
1	Ammonium bifluoride	acid ammonium fluoride ammonium hydrogen fluoride	
1, 2	Ammonium fluoride	neutral ammonium fluoride	
1	Hydrofluoric acid	fluohydric acid	
1	Sodium bifluoride		
1	Sodium fluoride	villiaumite	
1	Stannous fluoride		

	COMMON NAME	SYNONYMS	ISOMERS
1	Formaldehyde	methyl aldehyde methanal formalin	
1	Formic acid	methanoic acid	
1	Fumaric acid	trans-butenedioic acid trans-1, 2-ethylene-dicarboxylic acid boletic acid allomaleic acid	
1	Furfural	2-furaldehyde pyromucic aldehyde	
1, 2	Guthion	Gusathion azinphos-methyl	
1	Heptachlor	Velsicol-104 Drinox Heptagran	
1	Hydrochloric acid	hydrogen chloride muriatic acid	
1	Hydroxylamine	oxammonium	
	Iron compounds		
1	Ferric ammonium citrate	ammonium ferric citrate	
1	Ferric ammonium oxalate	ammonium ferric oxalate	
1	Ferric chloride	flores martis iron trichloride	
1	Ferric fluoride		
1	Ferric nitrate	iron nitrate	
1	Ferric sulfate	ferric persulfate ferric sesquisulfate ferric tersulfate	
1	Ferrous ammonium sulfate	Mohr's salt iron ammonium sulfate	
1	Ferrous chloride	iron chloride iron dichloride iron protochloride	
1	Ferrous sulfate	green vitriol iron vitriol iron sulfate iron protosulfate	
1	Isoprene	2-methyl-1, 3-butadiene	
1	Kelthane	di(p-chlorophenyl)-trichloromethylcarbinol DTMC dicofol	

	COMMON NAME	SYNONYMS	ISOMERS
	Lead compounds		
1	Lead acetate	sugar of lead	
1	Lead arsenate		
1	Lead chloride		
1	Lead fluoborate		
1	Lead fluoride	lead difluoride plumbous fluoride	
1	Lead iodide		
1	Lead nitrate		
1	Lead stearate	stearic acid lead salt	
1	Lead sulfate		
1	Lead sulfide	galena	
1	Lead tetraacetate		
1	Lead thiocyanate	lead sulfocyanate	
1	Lead thiosulfate		
1	Lead tungstate		
1	Lindane	gamma-BHC gamma-benzene hexachloride	
1	Malathion	phosphothion	
1	Maleic acid	cis-butenedioic acid cis-1, 2-ethylenedicarboxylic acid toxilic acid	
1	Maleic anhydride	2, 5-furandione cis-butenedioic anhydride toxilic anhydride	
	Mercury compounds		
1	Mercuric acetate	mercury acetate	
1	Mercuric cyanide	mercury cyanide	
1	Mercuric nitrate	mercury nitrate mercury pernitrate	
1	Mercuric sulfate	mercury sulfate mercury persulfate mercury bisulfate	
1	Mercuric thiocyanate	mercury thiocyanate mercuric sulfocyanate mercuric sulfocyanide	
1	Mercurous nitrate	mercury protonitrate	
1	Methoxychlor	DMDT methoxy-DDT	
1	Methyl mercaptan	methanethiol mercaptomethane methyl sulfhydrate thiomethyl alcohol	

	COMMON NAME	SYNONYMS	ISOMERS
1	Methyl methacrylate	methacrylic acid methyl ester methyl-2-methyl-2-propenoate	
1, 2	Methyl parathion	Nitrox-80	
1, 2	Mevinphos	Phosdrin	
1	Monoethylamine	ethylamine aminoethane	
1	Monomethylamine	methylamine aminomethane	
1	Naled	Dibrom	
1	Naphthalene	white tar tar camphor naphthalin	
1	Naphthenic acid	cyclohexanecarboxylic acid hexahydrobenzoic acid	
	Nickel compounds		
1	Nickel ammonium sulfate	ammonium nickel sulfate	
1, 2	Nickel chloride	nickelous chloride	
1	Nickel formate		
1	Nickel hydroxide	nickelous hydroxide	
1	Nickel nitrate		
1	Nickel sulfate	nickelous sulfate	
1	Nitric acid	aqua fortis	
1	Nitrobenzene	nitrobenzol oil of mirbane	
1	Nitrogen dioxide	nitrogen tetraoxide	
1	Nitrophenol	mononitrophenol	meta-; ortho-; para-nitrophenol
1	Paraformaldehyde	Paraform Formagene Triformol polymerized formaldehyde polyoxymethylene	
1, 2	Parathion	DNTP Niran	

	COMMON NAME	SYNONYMS	ISOMERS
1	Pentachlorophenol	PCP Penta	
1	Phenol	carbolic acid phenyl hydroxide hydroxybenzene oxybenzene	
1	Phosgene	diphosgene carbonyl chloride chloroformyl chloride	
1	Phosphoric acid	orthophosphoric acid	
1, 2	Phosphorus	black phosphorus red phosphorus white phosphorus yellow phosphorus	
1	Phosphorus oxychloride	phosphoryl chloride phosphorus chloride	
1	Phosphorus pentasulfide	phosphoric sulfide thiophosphoric anhydride phosphorus persulfide	
1	Phosphorus trichloride	phosphorous chloride	
1	Polychlorinated biphenyls	PCB Aroclor Polychlorinated diphenyls	
1	Potassium hydroxide	potassium hydrate caustic potash potassa	
1	Potassium permanganate	chameleon mineral	
1	Propionic acid	propanoic acid methylacetic acid ethylformic acid	
1	Propionic anhydride	propanoic anhydride methylacetic anhydride	
1	Propyl alcohol	ethyl carbinol propylic alcohol propanol	normal-; iso-propyl alcohol
1	Pyrethrins	Pyrethrin I Pyrethrin II	

	COMMON NAME	SYNONYMS	ISOMERS
1	Quinoline	1-benzazine benzo[b]pyridine leucoline chinoleine leucol	
1	Resorcinol	resorcin 1, 3-benzenediol meta-dihydroxybenzene	
	Selenium compounds		
1	Selenium oxide	selenium dioxide	
1, 2	Sodium selenite		
1	Sodium	natrium	
1	Sodium bisulfite	sodium acid sulfite sodium hydrogen sulfite	
1	Sodium hydrosulfide	sodium sulfhydrate	
1	Sodium hydroxide	caustic soda soda lye sodium hydrate	
1	Sodium hypochlorite	bleach	
1	Sodium methylate	sodium methoxide	
1	Sodium nitrite		
1	Sodium phosphate, dibasic		
1	Sodium phosphate, monobasic		
1	Sodium phosphate, tribasic		
1	Sodium sulfide		
1, 2	Strychnine		
1	Styrene	vinylbenzene phenylethylene styrol styrolene cinnamene cinnamol	
1	Sulfuric acid	oil of vitriol oleum	
1	Sulfur monochloride	sulfur chloride	

	COMMON NAME	SYNONYMS	ISOMERS
1	2, 4, 5-T (acid)	2, 4, 5-trichlorophenoxyacetic acid	
1	2, 4, 5-T (esters)	2, 4, 5-trichlorophenoxyacetic esters	
1	TDE	DDD	
1	Tetraethyl lead	lead tetraethyl TEL	
1, [redacted]	Tetraethyl pyrophosphate	TEPP	
1	Toluene	toluol methylbenzene phenylmethane Methacide	
1	Toxaphene	camphechlor	
1	Trichlorfon	Dipterex Dylox	
1	Trichlorophenol	Collunosol Dowicide 2 or 2S Omal Phenachlor	
1	Triethylamine		
1	Trimethylamine	TMA	
	Uranium compounds		
1	Uranium peroxide		
1	Uranyl acetate		
1	Uranyl nitrate		
1	Uranyl sulfate		
	Vanadium compounds		
1	Vanadium pentoxide	vanadic anhydride vanadic acid anhydride	
1	Vanadyl sulfate	vanadic sulfate vanadium sulfate	
1	Vinyl acetate	acetic acid ethylene ether	
1	Xylene	dimethylbenzene xylol	meta-; ortho-; para-xylene
1	Xylenol	dimethylphenol hydroxydimethyl benzene	
1, 2	Zectran	mexacarbate	

	COMMON NAME	SYNONYMS	ISOMERS
	Zinc compounds		
1	Zinc acetate		
1	Zinc ammonium chloride		
1	Zinc borate		
1	Zinc bromide		
1	Zinc carbonate		
1	Zinc chloride	butter of zinc	
1	Zinc fluoride		
1	Zinc formate		
1	Zinc hydrosulfite		
1	Zinc nitrate		
1	Zinc phenolsulfonate	zinc sulfocarbolate	
1, 2	Zinc phosphide		
1	Zinc potassium chromate	zinc yellow citron yellow buttercup yellow zinc chrome	
1	Zinc silicofluoride	zinc fluosilicate	
1	Zinc sulfate	white vitriol zinc vitriol white copperas	
1	Zinc sulfate, monohydrate		
	Zirconium compounds		
1	Zirconium acetate		
1	Zirconium potassium fluoride		
1	Zirconium nitrate		
1	Zirconium oxychloride	zirconyl chloride zirconium chloride, basic	
1	Zirconium sulfate	disulfatozirconic acid	
1	Zirconium tetrachloride		

[FR Doc.75-34948 Filed 12-29-75;8:48 am]

ENVIRONMENTAL PROTECTION AGENCY
(FRL 471-8)
[40 CFR Part 117]

DETERMINATION OF REMOVABILITY
OF HAZARDOUS SUBSTANCES
Notice of Proposed Rulemaking

Notice is hereby given in accordance with 5 U.S.C. 553 that the Administrator, Environmental Protection Agency, pursuant to the authority contained in Section 311(b)(2)(B)(i) of the Federal Water Pollution Control Act Amendments of 1972 (33 U.S.C. 1251 et seq.), proposes a new Part 117.

The Federal Water Pollution Control Act Amendments of 1972 (P.L. 92-500) amended the Federal Water Pollution Control Act of 1970 (33 U.S.C. 1151 et seq.) to add a new Section 311, which provides in Subsection (b)(2)(B)(i) as follows:

> "The Administrator shall include in any designation under subparagraph (A) of this subsection a determination whether any such designated hazardous substance can actually be removed."

In this notice, the Administrator proposes a determination of the actual removability of substances proposed (40 CFR Part 116) under Section 311(b)(2)(A).

On August 22, 1974, the Assistant Administrator for Water and Hazardous Materials published an Advance Notice of Proposed Rulemaking for the designation of hazardous substances and the determination of their removability (Federal Register, Vol. 39, No. 164, Part IV, pp. 30466-30471). In addition to selection criteria and a tentative list of substances under consideration for designation, factors and concepts relative to the determination of removability were set forth at that time. An initial determination was made that all substances under consideration were not "actually removable" from the water once discharged.

In response to the request for data and comments contained in the Advance Notice, 84 written comments were received and considered in the development of the proposed rule set forth herein. Comments and data relative to the selection criteria and listed substances are discussed in the proposed 40 CFR Part 116, published concurrently.

Several legal, technical, and administrative factors must be examined in the determination of the actual removability. The use of these factors to efficiently implement the law has been a cause of concern. These factors were identified throughout the development of the legislation. The situation may be best summarized by recognizing that "remove or removal" as defined in Section 311(a)(8) "... refers to removal of the oil or hazardous substances from the water and

shorelines or the taking of such other actions as may be necessary to minimize or mitigate damage to the public health or welfare, including but not limited to, fish, shellfish, wildlife, and public and private property shorelines and beaches." At the same time, Section 311(b)(2)(B)(i) requires "... a determination whether any such designated hazardous substance can actually be removed."

There are alternative ways of interpreting the question of determining removability. One alternative is to recognize that the definition of "remove" or "removal", which includes mitigating action, could be very broad covering any response activity. Therefore, almost any material discharged under almost any circumstances could be mitigated to some degree and therefore be determined to be removable. Alternatively, a determination which recognized that actual removability does not include damage mitigation would imply that few, if any, materials under all or even typical circumstances could be actually removed from the water. Between these two extremes, there appear to be some materials with properties which could be described as removable under certain conditions of discharge. However, a key restraint is that removability must be determined for the proposed substances in advance, and without consideration of the conditions surrounding the discharge.

In the August 22, 1974 Advance Notice of Proposed Rulemaking, the Agency made the following interpretation of the removability determination:

> To satisfy the requirement of section 311(b)(2)(B)(i), the Agency is considering the determination of actual removability from the water of each candidate substance. Factors under study in making this determination include the substance's solubility, density, physical state, dispersion characteristics, aquatic stress potential such as acute lethality, potential for leaving a residue, and detectability in the water body, as well as the current status of removal technology and availability of necessary equipment. Based upon these factors, the Agency is considering the determination that all of the substances listed in this advance notice of proposed rulemaking are not actually removable. In this respect it should be noted that section 311(a)(8) contains a definition of "remove" or "removal". The definition has two elements: (1) "Removal of the oil or hazardous substances from the water and shorelines"; and (2) "the taking of such other actions as may be necessary to minimize or mitigate damage to the public health or welfare." The phrase "actually be removed" as used in section 311(b)(2)(B)(i) is considered to refer only to the first element of this definition. In other words, if the spilled substance cannot normally be removed from a water body by physical, chemical or biological means, then it would not be "actually removable" for purposes of the eventual hazardous substance designation. The fact that some other action may be possible to "minimize or mitigate damage to the public health or welfare" -- does not make the substance "actually removable" for purposes of hazardous substance designation. However, actions taken under the second element of the definition in section 311(a)(8) -- i.e., actions taken to minimize or mitigate damage but which do not result in actual removal -- may qualify for reimbursement from the revolving fund under section 311(c) and may result in liability of the discharger under the conditions specified in section 311(f).

Thus, the Agency adopted the position that the regulatory requirement for determining "actual removability" under Section 311(b)(2)(B)(i) was separable from the provision of Sections 311(f) and 311(g) which hold the discharger liable for actions taken under Section 311(c)(1) and the broader definition of "remove" or "removal" found in Section 311(a)(8).

In response to the August 22, 1974, Advance Notice of Proposed Rulemaking, many commenters expressed the opinion that the tentative determination that all proposed substances are not actually removable was based on an overly restrictive interpretation of the regulatory requirement for determining removability. Recognizing the broad definition of "remove" or "removal", it was suggested by commenters that taking action to mitigate damages would, in fact, be taking action to actually remove discharges of hazardous substances. That argument fails to recognize that the basic thrust of Section 311 is the prevention of discharges of hazardous substances and the clean-up or mitigation of environmental damages when discharges do occur. Civil penalties are viewed as economic incentives to reduce discharges through prevention while clean-up liabilities insure the protection of public health or welfare. Although clean-up liabilities, which exist for substances determined to be actually removable, may provide incentives for prevention in some cases, it is clear that for discharges in many waters, effective damage mitigation or clean-up action is difficult. In these waters, discharges of substances determined to be actually removable could continually occur with no economic disincentive other than that set forth under Section 311(b)(6) being employed. Thus, the determination that any designated substance is actually removable would reduce the incentive to prevent discharge of that substance. The penalty presently employed under 311(b)(6) for oil discharges can be viewed as insufficient for discharges of hazardous substances that can force the closure of water supplies, fisheries, and other beneficial water uses.

After consideration of comments received and further evaluation of the legislative history, the Agency proposes to maintain the determination

of actual removability as set forth in the Advance Notice of Proposed Rulemaking of August 22, 1974, and cited above. In doing so, it is determined that all substances proposed (40 CFR Part 116) under Section 311(b)(2)(A) are not actually removable.

This regulation may be amended as necessary to reflect new information on the removability of hazardous substances.

Interested persons may participate in this rulemaking by submitting written comments or requests for information in triplicate to: Dr. C. Hugh Thompson, Chief, Hazardous Substances Branch, Criteria and Standards Division, Office of Water Planning and Standards, WH-595, Environmental Protection Agency, Washington, D.C. 20460.

A copy of all public comments will be available for inspection and copying at the U.S. Environmental Protection Agency, Public Information Reference Unit, Room 2922 (EPA Library), 401 M Street, S.W., Washington, D.C. 20460. The Environmental Protection Agency information regulation, 40 CFR Part 2, provides that a reasonable fee may be charged for copying.

All comments received on or before 60 calendar days after date of this publication will be considered.

Executive Order 11821 (November 27, 1974) requires that major proposals for legislation and promulgation of regulations and rules by agencies of the Executive Branch be accompanied by a statement certifying that the inflationary impact of the proposal has been evaluated.

A number of criteria have been defined to determine which actions require an inflationary impact statement. The Agency's analysis of the potential economic impact of these regulations indicate that none of the criteria defining a major proposal have been met. Thus, it is hereby certified that the economic and inflationary effects of this proposal have been carefully evaluated in accordance with Executive Order 11821 and that no inflationary impact statement is required.

/s/ Russell E. Train
Russell E. Train
Administrator

Dated: DEC 22 1975

CERTIFIED TO BE A TRUE COPY OF THE ORIGINAL DOCUMENT.

Part 117 - DETERMINATION OF REMOVABILITY OF HAZARDOUS SUBSTANCES

117.1 Applicability

117.2 Definitions

117.3 Determination of Actual Removability

Authority: Sections 311(b)(2)(B)(i) and 501(a) of the Federal Water Pollution Control Act Amendments of 1972 (33 U.S.C. 1251 et seq.).

117.1 APPLICABILITY

The regulations of this part make a determination under Section 311 (b)(2)(B)(i) of the Act as to the actual removability of substances designated under Section 311(b)(2)(A). This regulation applies to substances designated as hazardous under 40 CFR Part 116 when discharged into navigable waters or adjoining shorelines or the waters of the contiguous zone from vessels, onshore facilities or offshore facilities.

117.2 DEFINITIONS

Terms used in this part shall have the meanings as stated in 40 CFR Part 116 and as indicated below:

"The Act" means the Federal Water Pollution Control Act, as amended by the Federal Water Pollution Control Act Amendments of 1972, (P.L. 92-500), (33 U.S.C. 1251 et seq.);

"Remove" or "removal" refers to removal of the oil or hazardous substances from the water and shorelines or the taking of such other actions as may be necessary to minimize or mitigate damage to the public health or welfare, including, but not limited to, fish, shellfish, wildlife, and public and private property, shorelines, and beaches;

"Actually be removed" means the separation and isolation of discharged hazardous substances from all of the navigable waters of the U.S. and the contiguous zone by chemical, physical, or biological means.

117.3 DETERMINATION OF ACTUAL REMOVABILITY

The elements, compounds or their structural isomers, or mixtures thereof, designated as hazardous substances under 40 CFR Part 116 cannot actually be removed.

The determination that the designated substances cannot actually be removed by chemical, physical, or biological means does not relieve the discharger from damage mitigation liabilities under Sections 311(f) and 311(g) of the Act.

[FR Doc.75-34950 Filed 12-29-75;8:45 am]

ENVIRONMENTAL PROTECTION AGENCY
(FRL 472-1)
[40 CFR Part 118]

DETERMINATION OF HARMFUL QUANTITIES
FOR HAZARDOUS SUBSTANCES

Notice of Proposed Rulemaking

Notice is hereby given in accordance with 5 U.S.C. 553 that the Administrator, Environmental Protection Agency, under the authority contained in Section 311(b)(4) of the Federal Water Pollution Control Act Amendments of 1972 [33 U.S.C. 1251 et seq. (the Act)], and Executive Order 11735, proposes a new Part 118 of Title 40 of the Code of Federal Regulations which determines harmful quantities of those substances proposed (40 CFR Part 116) as hazardous under Section 311(b)(2)(A).

The Federal Water Pollution Control Act Amendments of 1972 (P.L. 92-500) amended the Federal Water Pollution Control Act of 1970 (33 U.S.C. 1151 et seq.) to add a new Section 311(b)(4) of the Act which states:

> "The President shall by regulation, to be issued as soon as possible after the date of enactment of this paragraph, determine for the purposes of this section, those quantities of oil and any hazardous substance the discharge of which, at such times, locations, circumstances, and conditions, will be harmful to the public health or welfare of the United States, including, but not limited to, fish, shellfish, wildlife, and public and private property, shorelines, and beaches except that in the case of the discharge of oil into or upon the waters of the contiguous zone, only those discharges which threaten the fishery resources of the contiguous zone or threaten to pollute or contribute to the pollution of the territory or the territorial sea of the United States may be determined to be harmful."

Executive Order 11735, dated August 3, 1973, delegated the authority of the President under Section 311(b)(4) to the Administrator of the Environmental Protection Agency.

This notice deals with "... hazardous substances, other than oil ..." as noted in Section 311(b)(2)(A). Regulations implementing the portion of Section 311(b)(4) dealing with oil are contained in 40 CFR Part 110. Part 110.3 of 40 CFR defines the harmful quantity of oil as:

> "...discharges of such quantities of oil into or upon the navigable waters of the United States or adjoining shorelines determined to be harmful to the public health or welfare of the United States, at all times and locations and under all circumstances and conditions, except as provided in Section 110.6 of this part, include discharges which:
>
> (a) Violate applicable water quality standards, or
>
> (b) Cause a film or sheen upon or discoloration of the surface of the water or adjoining shorelines or cause a sludge or emulsion to be deposited beneath the surface of the water or upon adjoining shorelines."

Oils are, in general, mixtures consisting of a number of discrete chemical compounds. There is considerable variation in both the number of these discrete compounds found in a given oil and in the proportion of each constituent, depending on origin and degree of refinement. As a consequence, the physical properties, chemical properties and toxicity of oils are somewhat variable. In contrast, hazardous substances, other than oil, are to be designated as "... elements and compounds ..." according to Section 311(b)(2)(A). By definition, different samples of a given element or a given compound display identical physical, chemical, and therefore toxicological properties, without regard to source.

Most oils have in common the ability to form surface sheens or to form sludges or emulsions in water. Damages attributed to these phenomena include the destruction of wildlife through contact with surface sheens or films, direct toxic effects to aquatic animals and plants by sludges, emulsions or soluble fractions, and the fouling of shorelines.

Although some of the substances considered for designation may share certain properties with oils, such as the ability to form surface sheens, this is not characteristic of the majority, and their environmental effects are not generally attributed to this behavior. Rather, the impact of non-oil spills most commonly observed is direct toxic action from soluble fractions.

In view of these differences between oils and other hazardous substances to be regulated under Section 311, this notice proposes a different method for determination of "harmful quantities" of hazardous substances other than oil.

The final promulgation of proposed 40 CFR Part 118 will activate Section 311(b)(5) which requires that discharges equal to or exceeding the harmful quantity be immediately reported to the appropriate agency of the United States government. The appropriate agency is proposed in 33 CFR Part 153 (Federal Register Vol. 39, No. 234, pp. 4189-4194, December 4, 1974). Section 311(b)(5) also provides for a criminal penalty of up to one year imprisonment, $10,000 fine, or both, for failure to meet the reporting requirements. Final promulgation activates Section 311(f) and 311(g) liabilities as well as Section 311(b)(6) civil

penalties for all hazardous substances. In addition, civil penalty provisions of Section 311(b)(2)(B)(iii) of the Act will be activated for those substances determined to be not actually removable under Section 311 (b)(2)(B)(i) (proposed 40 CFR Part 117).

Sections 311(b)(2)(A) and 311(b)(2)(B)(i) of the Act require that the Administrator designate hazardous substances and make a determination whether any such designated substance can actually be removed. On August 22, 1974, the Assistant Administrator for Water and Hazardous Materials published an Advance Notice of Proposed Rulemaking (Federal Register, Vol. 39, No. 164, Part IV, pp. 30466-30471). This Advance Notice set forth tentative criteria by which substances were considered for designation as hazardous, those substances under consideration, factors which influence removability, and an initial determination of the actual removability of substances currently under consideration. Public comment and data were requested on all aspects of the proposed action. The closing date for comments was October 15, 1974.

A number of substances listed in the August 22, 1974 Advance Notice of Proposed Rulemaking are not included in this notice due to public comment and data received. Most details concerning changes such as deletions, are presented in separate proposed rules for Designation of Hazardous Substances (proposed 40 CFR Part 116) and Determination of the Removability of Hazardous Substances (proposed 40 CFR Part 117). However, a number of additional comments were received on limitations to the applicability of the designation of hazardous substances. It is now considered most appropriate to limit the applicability

of this proposed rule and the proposed rule for Determination of the Units of Measurement and Rates of Penalty for Hazardous Substances (proposed 40 CFR Part 119).

The applicability stated in the Advance Notice of Proposed Rulemaking was as follows:

> "It is important to note that not all discharges of substances designated as hazardous will be subject to the enforcement provisions of section 311. Because section 311 applies only to discharges from vessels or facilities, a designation regulation would not apply to discharges from other sources such as agricultural land runoff, or irrigation return flows. The discharges being considered can be placed in two separate categories. The first relates to transportation and storage incidents in which there is normally no release of the substance except in the spill situation. The second relates to industrial production facilities in which a designated hazardous substance is released in quantities exceeding those of a permitted normally operating effluent. Periodic or continuous discharges are regulated under other provisions of the Act. Accordingly, the Agency is considering that the regulation would exclude from designation discharges of hazardous substances which are made: (a) in compliance with effluent limitations or guidelines established under sections 301, 302, 304, 306, and 307 of the Act; (b) in quantities not exceeding those identified for such substances in an application for an NPDES permit which has been issued pursuant to section 402 of the Act; (c) in compliance with permits issued under section 404 of the Act or sections 102 and 103 of the Marine Protection, Research Sanctuaries Act of 1972 (33 U.S.C. 1401 et seq.); (d) from properly functioning marine sanitation flow-through devices certified by the United States Coast Guard pursuant to section 312 of the Act; or (e) in the course of a permitted use of a pesticide registered under the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. sections 136 and through 136 y)."

Although most comments agreed with these exclusions, many pointed out that exclusion (b) created a potential conflict with the terms of the NPDES function under Section 402 of the Act. Only a few of the proposed hazardous substances are mentioned specifically in the NPDES

permits. For those constituents which are identified, the discharge permit cites an average mass per day limitation which is, in part, based on the production volume of the specific facility and are not monitored on a continuous basis. Maintaining the proposed language of exclusion (b) would, in effect, require the continuous monitoring of all listed substances. In fact, monitoring of some substances is simply not presently feasible.

Consequently, this proposed rule modifies the wording of exclusion (b) to read as follows:

"...in compliance with an NPDES permit which has been issued pursuant to Section 402 of the Act,...". General parameters contained in permits together with permit conditions based upon water quality considerations should, to a significant degree, control and limit discharges of hazardous substances.

A. Summary of Method for Determining Harmful Quantities

A procedure has been devised for determining harmful quantities of hazardous substances by modification of a system used by the Intergovernmental Maritime Consultative Organization (IMCO), a specialized agency in the United Nations system. Substances are divided into four categories on the basis of relative hazard to the environment. The smallest common commercial container size (one pound/454 grams) was then defined as the harmful quantity for all members of the most highly toxic category. Other categories were thereafter assigned harmful quantities on a proportional basis. If the upper aquatic toxicity limit of a category was ten times higher than the upper limit of the pre-

ceeding more toxic category, then the harmful quantity was set as ten times larger, and so forth.

B. General Considerations

This methodology is being proposed after detailed consideration of others which were finally rejected due to: excessive complexity; incomplete or conflicting data; difficulty visualized in implementation. The aternative methods are discussed in detail in Document EPA #440/9-75-005 a, b, c, d; Methodologies for Determining Harmful Quantities and Rates of Penalty for Hazardous Substances, (stock number 055-001-01028-1, available from: Superintendent of Documents, Government Printing Office, Washington, D.C. 20402, $10.00).

Section 311 is specific in its instruction to designate elements and compounds as hazardous substances. This has led to the development of methods for defining harmful quantities based on pure compound characteristics. The presence of additional materials in a mixture may affect toxicity through synergism, antagonism, addition or other interactive mechanisms. For these mixtures individual bioassays would be required to specify meaningful toxic levels. Such an approach is obviously not practicable since it is not possible to predict the combinations that might be involved. It is also not feasible to designate harmful quantities for all conceivable mixtures. Consequently, the approach proposed for dealing with mixtures or solutions is to assume that damages caused by individual constituents are additive. For a mixture or solution of substance X, substance Y and substance Z, etc., the weight of substance X is divided by the harmful quantity of pure substance X, the

weight of substance Y is divided by the harmful quantity of pure substance Y, and so forth. Next, the fractions derived in this fashion are added. If the total equals or exceeds unity, then the harmful quantity of the mixture or solution has been equaled or exceeded in the discharge.

The harm produced by the introduction of any pollutant to water is dependent upon the resulting concentration of that material in the water and upon receiving water characteristics. Determining harmful quantities thus requires some evaluation of probabilistic damage or harm to representative water bodies. Variations in water quality and other factors limit the practicality of regulating discharges in any but relative terms. The method set forth in this document is intended to deal with typical or average conditions in a way encouraging notification of hazardous substance discharges and to provide for equitable enforcement which, in turn, is intended to lead to the overall program goal of prevention.

Due to the present lack of compulsory reporting under Section 311(b)(5), the full magnitude of the problem of hazardous substance discharges is not fully understood. While many chemical users, producers, and transporters have voluntarily reported spills of materials they considered hazardous, no generally accepted list was available for guidance. This portion of the problem will be corrected by promulgation of 40 CFR Part 116, which provides such a list.

Another goal of this proposed rule is that it is intended to prompt reporting of as great a proportion of the total number of discharges as

possible. The establishment of harmful quantities for designated hazardous substances activates a compulsory notification requirement under Section 311(b)(5) for discharges equal to or greater than the harmful quantity. The intent of the Agency is to assess civil penalties under Section 311(b)(2)(B)(iii) only for those discharges which equal or exceed the harmful quantity. Voluntary reporting is thus encouraged in hopes of obtaining more complete knowledge of the extent of the hazardous substance problem.

C. Proposed Determination of Harmful Quantity

A procedure was developed for determining harmful quantities based on a proposed hazardous material classification system found in Annex II of the International Conference on Marine Pollution, 1973[1], which has been submitted by the Intergovernmental Maritime Consultative Organization (IMCO) to member nations for adoption. The basic system was intended, in part, to regulate operational discharges of ships transporting noxious substances in bulk. These materials are categorized on the basis of a profile of relative "hazard potential." The concept of harmful quantity is not present in the basic system. Consequently, modifications are necessary to meet the requirements of Section 311 and will be spelled out following review of the original system.

1. Basic System

The chemicals originally considered under the basic System were "all noxious and hazardous substances other than oil"[1] as defined by the 1954 Oil Pollution Convention. The basic system grouped these noxious materials with respect to the five "hazard potentials": (1) bioaccumulation, (2) damage to living resources, (3) hazards to human health (oral intake), (4) hazards to human health (external exposure), and (5) reduction of amenities, based upon the data and opinions of the Group of Experts on the Scientific Aspects of Marine Pollution (GESAMP)[2]. A partial extract of the profiling system is reproduced from page 90, and the associated legend is also reproduced from page 98 of reference 1.

HAZARD PROFILE OF SELECTED SUBSTANCES

Substances	Bioaccumulation (A)	Damage to living resources (B)	Hazard to human health: Oral intake (C)	Hazard to human health: Skin contact and inhalation (vapors) (D)	Reduction of amenities (E)	Remarks
Acetaldehyde	0	1	1	0	X	
Acetic acid	0	1	0	0	0	
Acetic anhydride	0	1	0	0	0	
Acetone	0	1	0	0	0	
Acetone cyanohydrin	0	1	1	1	XX	
Acetonitrile (methyl cyanide)	0	1	1	0	0	
Acetyl chloride	0	1	1	0	0	
Acrolein	T	1	1	1	XXX	
Acrylic acid	0	(2)	1	1	XX	
Acrylic latex	0	1	0	0	XX	Tie cat. 0 due to possible presence of unknown inhibitors.

(PARTIAL TABLE)

1. "Hearing Before the Committee on Commerce on 1973 IMCO Conference on Marine Pollution from Ships, November 1973, U.S. Senate, 93rd Congress, First Session Series 93-52."

2. This Group is jointly sponsored by the specialized agencies of the United Nations system including, UN, FAO, UNESCO, WHO, WMO, IMCO, and IAEA.

LEGEND TO THE HAZARD PROFILES

Column A—Bioaccumulation:

+	Bioaccumulated and liable to produce a hazard to aquatic life or human health.
O	Not known to be significantly bioaccumulated.
Z	Short retention of the order of one week or less.
T	Liable to produce tainting of seafood.

Column B—Damage to living resources:

Ratings		TLm (p/m
4	Highly toxic	<1
3	Moderately toxic	1–10
2	Slightly toxic	10–100
1	Practically nontoxic	100–1,000
0	Nonhazardous	≥1,000
BOD	Problem caused primarily by high oxygen demand	----------
D	Deposits liable to blanket the seafloor	----------

Column C—Hazard to human health, oral intake:

Ratings		LDm mg/kg
4	Highly Hazardous	<5
3	Moderately hazardous	5–50
2	Slightly hazardous	50–500
1	Practically nonhazardous	500–5,000
0	Nonhabardous	≥5,000

Column D—Hazard to human health, skin contact and inhalation (solution):

II	Hazardous (solution).
I	Slightly hazardous (solution).
0	Nonhazardous (solution).

Column E—Reduction of amenities:

Ratings	
xxx	Highly objectionable because of persistence, smell, or poisonous or irritant characteristics; beaches liable to be closed.
xx	Moderately objectionable because of the above characteristics, but short-term effects leading to temporary interference with use of beaches.
x	Slightly objectionable, no interference with use of beaches.
0	No problem.

All Columns: Ratings in brackets, ( ), indicate insufficient data available to the Panel on specific substances, hence extrapolation was required.

2. Modification of the Basic System

The advantages of domestic regulations which are compatible with an international convention are readily apparent. Also, from an operational viewpoint, a method which considers groups of chemicals rather than individual chemicals simplifies reporting. However, a number of modifications to the basic system must be made to satisfy the requirements of Section 311.

The modifications required are as follows:

a). Hazardous materials already categorized must be reexamined in terms of fresh and salt water hazard potential and the latest available data.

b). Materials not previously considered by IMCO must be categorized.

c). Small modifications must be made to facilitate more quantitative and objective categorization and to further clarify the term "additional factors in the hazard profile" used by IMCO. To this end, the guidelines in Table I for categorization have been modified to read as found below.

d). The final modification is necessary due to the concept of harmful quantity [from Section 311(b)(4)] which is not found in the basic system. A mechanism must be devised for deriving a consistent set of harmful quantities based on quantitative differentiation between categories. To this end, aquatic toxicity (96-hr. LC50) was selected since it is the only criterion common to all categories in the basic system and is the only one which permits a quantitative comparison between categories. Otherwise, it becomes necessary to subjectively evaluate between different hazard potentials, such as the relative hazards of bioaccumulation as opposed to reduction of amenities.

The hazard profiles described above were then used by a committee of the Intergovernmental Maritime Consultative Organization (IMCO) to assign the materials to one of several categories as shown in the partial list below. (Reproduction from page 157 of reference 1.)

—LIST OF NOXIOUS LIQUID SUBSTANCES CARRIED IN BULK

Substance	U.N. number (I)	Pollution category for operational discharge (regulation 5 of annex II) (II)	Residual concentration (percent by weight) (Regulation 5(1) of annex II) outside special areas (III)	Residual concentration (percent by weight) (Regulation 5(2) of annex II) within special areas (IV)
Acetaldehyde	1089	C		
Acetic acid	1842	C		
Acetic anhydride	1715	C		
Acetone	1090	D	0.1	0.05
Acetone cyanohydrin	1541	A		
Acetyl chloride	1717	C	.1	.05
Acrolein	1092	A		
Acrylic acid		C		
Acrylonitrile	1093	B		
Adiponitrile		D		

This categorization was done according to the guidelines and tabulations from page 156 in reference 1 reproduced below.

GUIDELINES FOR THE CATEGORIZATION OF NOXIOUS LIQUID SUBSTANCES

Category A.—Substances which are bioaccumulated and liable to produce a hazard to aquatic life or human health; or which are highly toxic to aquatic life (as expressed by a Hazard Rating 4, defined by a TLm less than 1 ppm); and additionally certain substances which are moderately toxic to aquatic life (as expressed by a Hazard Rating 3, defined by a TLm of 1 or more, but less than 10 ppm) when particular weight is given to additional factors in the hazard profile or to special characteristics of the substance.

Category B.—Substances which are bioaccumulated with a short retention of the order of one week or less; or which are liable to produce tainting of the sea food; or which are moderately toxic to aquatic life (as expressed by a Hazard Rating 3, defined by a TLm of 1 ppm or more, but less than 10 ppm); and additionally certain substances which are slightly toxic to aquatic life (as expressed by a Hazard Rating 2, defined by a TLm of 10 ppm or more, but less than 100 ppm) when particular weight is given to additional factors in the hazard profile or to special characteristics of the substance.

Category C.—Substances which are slightly toxic to aquatic life (as expressed by a Hazard Rating 2, defined by a TLm of 10 or more, but less than 100 ppm); and additionally certain substances which are practically non-toxic to aquatic life (as expressed by a Hazard Rating 1, defined by a TLm of 100 ppm or more, but less than 1,000 ppm) when particular weight is given to additional factors in the hazard profile or to special characteristics of the substance.

Category D.—Substances which are practically non-toxic to aquatic life (as expressed by a hazard rating 1, defined by a TLm of 100 ppm or more, but less than 1,000 ppm); or causing deposits blanketing the seafloor with a high biochemical oxygen demand (BOD); or highly hazardous to human health, with an LD_{50} of less than 5 mg/kg; or produce moderate reduction of amenities because of persistency, smell or poisonous or irritant characteristics, possibly interfering with use of beaches; or moderately hazardous to human health, with an LD_{50} of 5 mg/kg or more, but less than 50 mg/kg and produce slight reduction of amenities.

Other Liquid Substances (for the purposes of Regulation 4 of this Annex).—Substances other than those categorized in Categories A, B, C and D above.

TABLE I
EPA GUIDELINES
FOR CATEGORIZING HAZARDOUS SUBSTANCES

Category A includes substances which are;

(a) bioaccumulated and liable to produce a hazard to aquatic life or human health (Rating +), or

(b) highly toxic to aquatic life (Rating 4), or

(c) moderately toxic to aquatic life (Rating 3) and also liable to produce tainting of sea food (Rating T), or

(d) bioaccumulated with a short retention of the order of one week or less (Rating Z) while also being moderately toxic to aquatic life (Rating 3) and causing severe reduction of amenities (Rating XXX).

Category B includes substances which are;

(a) bioaccumulated with a short retention of the order of one week or less (Rating Z), or

(b) liable to produce tainting of sea food (Rating T), or

(c) moderately toxic to aquatic life (Rating 3).

Category C includes substances which;

(a) are slightly toxic to aquatic life (Rating 2), or

(b) cause serious reduction of amenities described as highly objectionable because of persistency, smell, irritant or poisonous characteristics (Rating XXX), or

(c) are practically non-toxic to aquatic life (Rating 1) while also being at least moderately hazardous to human health (oral intake) (Rating 4 or 3) and causing moderate reduction of amenities (Rating XX).

Category D includes substances which;

(a) are practically non-toxic to aquatic life (Rating 1), or

(b) are highly hazardous to human health (oral intake), (Rating 4), or

(c) cause deposits blanketing the sea floor with a high biochemical oxygen demand (Rating BOD) and produce moderate reduction of amenities (Rating XX), or

(d) are moderately hazardous to human health (oral intake), (Rating 3), and also cause a slight reduction of amenities (Rating X).

The smallest container used in commerce for a typical category A material, for example an inorganic cyanide, is a one-pound (0.454 kilogram) bottle. Consequently, this amount has been chosen as the "harmful quantity" of all category A materials. Other categories are thereafter assigned harmful quantities on a proportional basis as shown in Table II. Basically, if the upper aquatic toxicity limit of a category is ten times higher than the upper limit of the preceeding, more toxic category, then the harmful quantity is set as ten times larger, and so forth.

TABLE II
EPA CATEGORIES
FOR HARMFUL QUANTITY DETERMINATION

Category	Representative Range	Harmful Quantity lb. (kg.)
A	LC50* < 1 ppm	1.0 (0.454)
B	1 ppm ≤ LC50 < 10 ppm	10 (4.54)
C	10 ppm≤LC50 <100 ppm	100 (45.4)
D**	100 ppm≤LC50 ≤ 500 ppm	500 (227)

The representative range means that substances in Category A have LC50 values of less than 1 ppm, Category B substances have LC50 values of 1 ppm or greater up to 10 ppm, Category C substances have LC50 values of 10 ppm or greater up to 100 ppm, and Category D substances have LC50 values of 100 ppm up to and including 500 ppm.

* LC50 means that concentration of material which is lethal to one-half of the test population of aquatic animals upon continuous exposure for 96 hours or less.

** The basic IMCO criterion for Category D aquatic toxicity is 96-hr. LC50 values of 100-1000 ppm. The selection criteria for materials proposed in 40 CFR Part 116 eliminated any material with a 96-hr. LC50 in excess of 500 ppm. Thus, the representative toxicity range for Category D proposed here has been changed to 100-500 ppm.

D. Special Waters

Special waters are proposed to be defined as those waters which are: (1) drinking water reservoirs; (2) part of a designated National Wildlife Refuge System (50 CFR Part 25); or (3) part of a designated National Forest Wilderness, a designated National Park System, or a designated National Wilderness Preserve System (43 CFR Part 19.2). Because of their unique value, it is proposed that any quantity of a substance designated in 40 CFR Part 116 constitutes a harmful quantity when discharged into these special waters.

The EPA category and harmful quantity determined for each substance proposed as hazardous are listed in the proposed rule. Interested persons may participate in this rulemaking by submitting written comments or requests for information in triplicate to: Dr. C. Hugh Thompson, Chief, Hazardous Substances Branch, (WH-595) Environmental Protection Agency, Waterside Mall, Room 2824, 401 M Street, S.W., Washington, D.C. 20460.

The Agency is particularly interested in comments relative to:

1). the methods employed for arriving at harmful quantites,
2). the potential number of discharges of listed substances in excess of the harmful quantity,
3). the potential impact on producers, transporters, and handlers of hazardous substances,
4). the workability of the proposed regulation and,
5). the definition of "special waters".

All comments received on or before 60 calendar days after date of this publication, will be considered.

A copy of all comments will be available for inspection and copying at the U.S. Environmental Protection Agency, Public Information Reference Unit, Room 2922 (EPA Library), 401 M Street, S.W., Washington, D.C. 20460. (40 CFR Part 2 provides that a reasonable fee may be charged for copying.)

Executive Order 11821 (November 27, 1974) requires that major proposals for legislation and promulgation of regulations and rules by agencies of the Executive Branch be accompanied by a statement certifying that the inflationary impact of the proposal has been evaluated.

A number of criteria have been defined to determine which actions require an inflationary impact statement. The Agency's analysis of the potential economic impact of these regulations indicate that none of the criteria defining a major proposal have been met. Thus, it is hereby certified that the economic and inflationary effects of this proposal have been carefully evaluated in accordance with Executive Order 11821 and that no inflationary impact statement is required.

/s/ Russell E. Train

Russell E. Train
Administrator

Dated: DEC 22 1975

Lena Noble

CERTIFIED TO BE A TRUE COPY OF THE ORIGINAL DOCUMENT.

Part 118 - DETERMINATION OF HARMFUL QUANTITIES FOR HAZARDOUS SUBSTANCES

118.1 Applicability
118.2 Abbreviations
118.3 Definitions
118.4 Determination of Harmful Quantities
118.5 Demonstration Projects
118.6 Notice
118.7 Penalties
118.8 Liabilities

Authority: Sections 311(b)(4) and 501(a) of the Federal Water Pollution Control Act of 1972, [33 U.S.C. 1251 et seq., (the Act)] and Executive Order 11735.

118.1 APPLICABILITY

The regulation of this part makes a determination of the harmful quantity of substances designated as hazardous in 40 CFR Part 116. The regulation applies to designated substances in quantities equal to or greater than those set forth below, when discharged into navigable waters or adjoining shorelines or the waters of the contiguous zone from vessels and onshore and offshore facilities, except when the owner or operator can show such discharges are made (1) in compliance with requirements of Sections 301, 302, 304, 306, 307 of the Act, and in compliance with an NPDES permit which has been issued pursuant to Section 402 of the Act, (2) in compliance with permits issued under Section 404 of the Act or Sections 102 and 103 of the Marine Protection, Research and Sanctuaries Act of 1972, (33 U.S.C. 1401 et seq.), (3) in compliance with approved water treatment plant operations as specified

by local, State or Federal health regulations pertaining to safe drinking water, (4) from properly functioning marine sanitation flow-through devices certified by the United States Coast Guard pursuant to Section 312 of the Act, or (5) in the course of a permitted use of a pesticide registered under 40 CFR Part 162 (Federal Register, Vol., 40, No. 129, Part II, pp. 28242-28280, July 3, 1975) by authority of the Federal Insecticide, Fungicide, and Rodenticide Act, as amended by the Federal Environmental Pesticide Control Act of 1972 (86 Stat. 973, P.L. 92-516, 7 U.S.C. 136 et seq.).

118.2 ABBREVIATIONS

lb = pound

kg = kilogram

HQ = harmful quantity

118.3 DEFINITIONS

As used in this part, all terms shall have the same meaning as used in Section 311 of the Act and 40 CFR Parts 116 and 117.

118.4 DETERMINATION OF HARMFUL QUANTITIES

The quantities listed with each substance name in Table 118.4 are determined to be the harmful quantities for those substances, except when discharged into "special waters". Those waters which are (1) drinking water reserviors, (2) part of a designated National Wildlife Refuge (50 CFR Part 25), or (3) part of a designated National Forest Wilderness, a designated National Park, or a designated National Wilderness Preserve (43 CFR Part 19.2) are defined as "special

waters". Because of their unique value, any quantity of a substance designated in 40 CFR Part 116 constitutes a harmful quantity when discharged into these special waters.

Harmful quantities of mixtures or solutions are considered additive based upon proportions of the individual elements or compounds as follows. For a mixture or solution of substance X, substance Y, and substance Z, etc., the weight of substance X discharged is divided by the harmful quantity of pure substance X, the weight of substance Y discharged is divided by the harmful quantity of pure substance Y, and so forth. Next, the fractions so derived are added. If the total equals or exceeds unity, then the harmful quantity of the mixture or solution has been equaled or exceeded.

118.5 DEMONSTRATION PROJECTS

Notwithstanding any other provisions of this part, the Administrator of the Environmental Protection Agency may permit, on a case-by-case basis, the discharge of harmful quantities of designated hazardous substances, other than oil, into or upon the navigable waters or adjoining shorelines or the waters of the contiguous zone in connection with research, demonstration projects, or studies relating to the prevention, control, or abatement of hazardous substance pollution.

118.6 NOTICE

Any person in charge of a vessel or an onshore or an offshore facility shall, as soon as he has knowledge of any discharge of designated hazardous substances, other than oil, from such vessel or facility in

excess of the harmful quantity determined by this part, immediately notify the appropriate agency of the United States Government of such discharge. Notice shall be given in accordance with such procedures as the Secretary of Transportation may prescribe and as set forth in 33 CFR Part 153 (proposed revision published December 4, 1974 in the Federal Register, Vol. 139, No. 234, pp. 4189-4194).

118.7 PENALTIES

An owner or operator failing to immediately notify the United States Government of discharges equal to or greater than those quantities determined to be harmful as set forth in this part may be subject to criminal penalties of not more than $10,000 or imprisonment for not more than one year or both under Section 311(b)(5).

An owner or operator responsible for the discharge of substances designated in 40 CFR Part 116 in quantities equal to or exceeding the harmful quantities established in this part may be assessed a civil penalty of up to $5,000 under Section 311 (b)(6).

An owner or operator responsible for the discharge of substances designated in 40 CFR Part 116 and determined to be not actually removable in 40 CFR Part 117 in quantities equal to or exceeding the harmful quantities established in this part may be subject to a civil penalty assessed under Section 311(b)(2)(B)(iii) as set forth in 40 CFR Part 119.

118.8 LIABILITIES

Subject to the limits of liability found in Sections 311(f) and (g), the

owner or operator of any vessel or onshore or offshore facility from which a hazardous substance designated in 40 CFR Part 116 is discharged in quantities equal to or exceeding harmful quantities determined by this part, shall be liable to the United States Government for the actual costs incurred under Section 311(c) for the removal of such substance. Removal refers to removal of the hazardous substance from the water and shorelines or the taking of such other actions as may be necessary to minimize or mitigate damage to the public health or welfare, including, but not limited to, fish, shellfish, wildlife, and public and private property, shorelines, and beaches.

TABLE 118.4
HARMFUL QUANTITIES OF HAZARDOUS SUBSTANCES

The first number under the column headed "HQ" is the harmful quantity in pounds. The number in parentheses is the metric equivalent in kilograms. The column headed "Category" lists the EPA Category associated with each substance.

Material	Category	HQ in lb (kg)
Acetaldehyde	C	100 (45.4)
Acetic Acid	C	100 (45.4)
Acetic Anhydride	C	100 (45.4)
Acetone Cyanohydrin	C	100 (45.4)
Acetyl Bromide	D	500 (227)
Acetyl Chloride	D	500 (227)
Acrolein	A	1 (0.454)
Acrylonitrile	C	100 (45.4)
Adiponitrile	D	500 (227)
Aldrin	A	1 (0.454)
Allyl Alcohol	B	10 (4.54)
Allyl Chloride	C	100 (45.4)
Aluminum Fluoride	D	500 (227)
Aluminum Sulfate	D	500 (227)
Ammonia	C	100 (45.4)
Ammonium Acetate	D	500 (227)
Ammonium Benzoate	D	500 (227)
Ammonium Bicarbonate	D	500 (227)
Ammonium Bichromate	D	500 (227)

Material	Category	HQ in lb (kg)
Ammonium Bifluoride	D	500 (227)
Ammonium Bisulfite	D	500 (227)
Ammonium Bromide	D	500 (227)
Ammonium Carbamate	D	500 (227)
Ammonium Carbonate	D	500 (227)
Ammonium Chloride	D	500 (227)
Ammonium Chromate	D	500 (227)
Ammonium Citrate	D	500 (227)
Ammonium Fluoborate	D	500 (227)
Ammonium Fluoride	D	500 (227)
Ammonium Hydroxide	C	100 (45.4)
Ammonium Hypophosphite	D	500 (227)
Ammonium Iodide	D	500 (227)
Ammonium Nitrate	D	500 (227)
Ammonium Oxalate	D	500 (227)
Ammonium Pentaborate	D	500 (227)
Ammonium Persulfate	D	500 (227)
Ammonium Silicofluoride	C	100 (45.4)
Ammonium Sulfamate	D	500 (227)
Ammonium Sulfide	D	500 (227)
Ammonium Sulfite	D	500 (227)
Ammonium Tartrate	D	500 (227)
Ammonium Thiocyanate	D	500 (227)
Ammonium Thiosulfate	D	500 (227)
Amyl Acetate	C	100 (45.4)
Aniline	C	100 (45.4)

Material	Category	HQ in lb (kg)
Antimony Pentachloride	C	100 (45.4)
Antimony Pentafluoride	C	100 (45.4)
Antimony Potassium Tartrate	C	100 (45.4)
Antimony Tribromide	C	100 (45.4)
Antimony Trichloride	C	100 (45.4)
Antimony Trifluoride	C	100 (45.4)
Antimony Trioxide	C	100 (45.4)
Arsenic Acid	C	100 (45.4)
Arsenic Disulfide	C	100 (45.4)
Arsenic Pentoxide	B	10 (4.54)
Arsenic Trichloride	C	100 (45.4)
Arsenic Trioxide	B	10 (4.54)
Arsenic Trisulfide	B	10 (4.54)
Barium Cyanide	A	1 (0.454)
Benzene	C	100 (45.4)
Benzoic Acid	D	500 (227)
Benzonitrile	C	100 (45.4)
Benzoyl Chloride	D	500 (227)
Benzyl Chloride	D	500 (227)
Beryllium Chloride	D	500 (227)
Beryllium Fluoride	C	100 (45.4)
Beryllium Nitrate	C	100 (45.4)
Butyl Acetate	C	100 (45.4)
Butylamine	C	100 (45.4)
Butyric Acid	D	500 (227)

Material	Category	HQ in lb (kg)
Cadmium Acetate	A	1 (0.454)
Cadmium Bromide	A	1 (0.454)
Cadmium Chloride	A	1 (0.454)
Calcium Arsenate	C	100 (45.4)
Calcium Arsenite	C	100 (45.4)
Calcium Carbide	D	500 (227)
Calcium Chromate	D	500 (227)
Calcium Cyanide	A	1 (0.454)
Calcium Dodecylbenzene-sulfonate	B	10 (4.54)
Calcium Hydroxide	D	500 (227)
Calcium Hypochlorite	A	1 (0.454)
Calcium Oxide	D	500 (227)
Carbaryl	B	10 (4.54)
Captan	A	1 (0.454)
Carbon Disulfide	C	100 (45.4)
Chlordane	A	1 (0.454)
Chlorine	A	1 (0.454)
Chlorobenzene	B	10 (4.54)
Chloroform	B	10 (4.54)
Chlorosulfonic Acid	C	100 (45.4)
Chromic Acetate	D	500 (227)
Chromic Acid	D	500 (227)
Chromic Sulfate	D	500 (227)
Chromous Chloride	D	500 (227)
Chromyl Chloride	D	500 (227)

Material	Category	HQ in lb (kg)
Cobaltous Bromide	C	100 (45.4)
Cobaltous Fluoride	C	100 (45.4)
Cobaltous Formate	C	100 (45.4)
Cobaltous Sulfamate	C	100 (45.4)
Coumaphos	A	1 (0.454)
Cresol	B	10 (4.54)
Cupric Acetate	B	10 (4.54)
Cupric Acetoarsenite	B	10 (4.54)
Cupric Chloride	B	10 (4.54)
Cupric Formate	B	10 (4.54)
Cupric Glycinate	B	10 (4.54)
Cupric Lactate	B	10 (4.54)
Cupric Nitrate	B	10 (4.54)
Cupric Oxalate	B	10 (4.54)
Cupric Subacetate	B	10 (4.54)
Cupric Sulfate	B	10 (4.54)
Cupric Sulfate Ammoniated	B	10 (4.54)
Cupric Tartrate	B	10 (4.54)
Cuprous Bromide	B	10 (4.54)
Cyanogen Chloride	A	1 (0.454)
Cyclohexane	C	100 (45.4)
2,4-D Acid	B	10 (4.54)
2,4-D Esters	B	10 (4.54)
Dalapon	B	10 (4.54)
DDT	A	1 (0.454)

Material	Category	HQ in lb (kg)
Diazinon	A	1 (0.454)
Dicamba	C	100 (45.4)
Dichlobenil	C	100 (45.4)
Dichlone	A	1 (0.454)
Dichlorvos	A	1 (0.454)
Dieldrin	A	1 (0.454)
Diethylamine	C	100 (45.4)
Dimethylamine	C	100 (45.4)
Dinitrobenzene	C	100 (45.4)
Dinitrophenol	B	10 (4.54)
Diquat	C	100 (45.4)
Disulfoton	A	1 (0.454)
Diuron	B	10 (4.54)
Dodecylbenzenesulfonic Acid	B	10 (4.54)
Dursban	A	1 (0.454)
Endosulfan	A	1 (0.454)
Endrin	A	1 (0.454)
Ethion	A	1 (0.454)
Ethylbenzene	C	100 (45.4)
Ethylenediamine	C	100 (45.4)
EDTA	D	500 (227)
Ferric Ammonium Citrate	C	100 (45.4)
Ferric Ammonium Oxalate	C	100 (45.4)
Ferric Chloride	C	100 (45.4)

Material	Category	HQ in lb (kg)
Ferric Fluoride	C	100 (45.4)
Ferric Nitrate	C	100 (45.4)
Ferric Sulfate	C	100 (45.4)
Ferrous Ammonium Sulfate	C	100 (45.4)
Ferrous Chloride	C	100 (45.4)
Ferrous Sulfate	C	100 (45.4)
Formaldehyde	C	100 (45.4)
Formic Acid	D	500 (227)
Fumaric Acid	D	500 (227)
Furfural	C	100 (45.4)
Guthion	A	1 (0.454)
Heptachlor	A	1 (0.454)
Hydrochloric Acid	D	500 (227)
Hydrofluoric Acid	D	500 (227)
Hydrogen Cyanide	A	1 (0.454)
Hydroxylamine	D	500 (227)
Isoprene	C	100 (45.4)
Isopropanolamine Dodecylbenzenesulfonate	B	10 (4.54)
Kelthane	C	100 (45.4)
Lead Acetate	D	500 (227)
Lead Arsenate	D	500 (227)
Lead Chloride	D	500 (227)
Lead Fluoborate	D	500 (227)
Lead Fluoride	C	100 (45.4)
Lead Iodide	D	500 (227)

Material	Category	HQ in lb (kg)
Lead Nitrate	D	500 (227)
Lead Stearate	D	500 (227)
Lead Sulfate	D	500 (227)
Lead Sulfide	C	100 (45.4)
Lead Tetraacetate	D	500 (227)
Lead Thiocyanate	D	500 (227)
Lead Thiosulfate	D	500 (227)
Lead Tungstate	D	500 (227)
Lindane	A	1 (0.454)
Lithium Bichromate	D	500 (227)
Lithium Chromate	D	500 (227)
Malathion	A	1 (0.454)
Maleic Acid	D	500 (227)
Maleic Anhydride	D	500 (227)
Mercuric Acetate	A	1 (0.454)
Mercuric Cyanide	A	1 (0.454)
Mercuric Nitrate	A	1 (0.454)
Mercuric Sulfate	A	1 (0.454)
Mercuric Thiocyanate	A	1 (0.454)
Mercurous Nitrate	A	1 (0.454)
Methoxychlor	A	1 (0.454)
Methyl Mercaptan	B	10 (4.54)
Methyl Methacrylate	D	500 (227)
Methyl Parathion	B	10 (4.54)
Mevinphos	A	1 (0.454)
Monoethylamine	C	100 (45.4)

Material	Category	HQ in lb (kg)
Monomethylamine	C	100 (45.4)
Naled	A	1 (0.454)
Naphthalene	B	10 (4.54)
Naphthenic Acid	A	1 (0.454)
Nickel Ammonium Sulfate	D	500 (227)
Nickel Chloride	D	500 (227)
Nickel Formate	C	100 (45.4)
Nickel Hydroxide	C	100 (45.4)
Nickel Nitrate	D	500 (227)
Nickel Sulfate	D	500 (227)
Nitric Acid	C	100 (45.4)
Nitrobenzene	D	500 (227)
Nitrogen Dioxide	C	100 (45.4)
Nitrophenol	B	10 (4.54)
Paraformaldehyde	C	100 (45.4)
Parathion	A	1 (0.454)
Pentachlorophenol	A	1 (0.454)
Phenol	B	10 (4.54)
Phosgene	D	500 (227)
Phosphoric Acid	D	500 (227)
Phosphorous	A	1 (0.454)
Phosphorous Oxychloride	D	500 (227)
Phosphorous Pentasulfide	C	100 (45.4)
Phosphorous Trichloride	D	500 (227)
Polychlorinated Biphenyls	A	1 (0.454)

Material	Category	HQ in lb (kg)
Potassium Arsenate	C	100 (45.4)
Potassium Arsenite	C	100 (45.4)
Potassium Bichromate	D	500 (227)
Potassium Chromate	D	500 (227)
Potassium Cyanide	A	1 (0.454)
Potassium Hydroxide	C	100 (45.4)
Potassium Permanganate	B	10 (4.54)
Propionic Acid	D	500 (227)
Propionic Anhydride	D	500 (227)
Propyl Alcohol	D	500 (227)
Pyrethrins	C	100 (45.4)
Quinoline	A	1 (0.454)
Resorcinol	B	10 (4.54)
Selenium Oxide	C	100 (45.4)
Sodium	C	100 (45.4)
Sodium Arsenate	C	100 (45.4)
Sodium Arsenite	C	100 (45.4)
Sodium Bichromate	D	500 (227)
Sodium Bifluoride	D	500 (227)
Sodium Bisulfite	D	500 (227)
Sodium Chromate	D	500 (227)
Sodium Cyanide	A	1 (0.454)
Sodium Dodecylbenzene-sulfonate	B	10 (4.54)
Sodium Fluoride	D	500 (227)
Sodium Hydrosulfide	D	500 (227)

Material	Category	HQ in lb (kg)
Sodium Hydroxide	C	100 (45.4)
Sodium Hypochlorite	A	1 (0.454)
Sodium Methylate	C	100 (45.4)
Sodium Nitrite	B	10 (4.54)
Sodium Phosphate Monobasic	D	500 (227)
Sodium Phosphate Dibasic	D	500 (227)
Sodium Phosphate Tribasic	D	500 (227)
Sodium Selenite	C	100 (45.4)
Sodium Sulfide	C	100 (45.4)
Stannous Fluoride	D	500 (227)
Strontium Chromate	D	500 (227)
Strychnine	C	100 (45.4)
Styrene	C	100 (45.4)
Sulfuric Acid	C	100 (45.4)
Sulfur Monochloride	D	500 (227)
2,4,5-T Acid	A	1 (0.454)
2,4,5-T Esters	A	1 (0.454)
TDE	A	1 (0.454)
Tetraethyl Lead	A	1 (0.454)
Tetraethyl Pyrophosphate	B	10 (4.54)
Toluene	C	100 (45.4)
Toxaphene	A	1 (0.454)
Trichlorfon	B	10 (4.54)
Trichlorophenol	A	1 (0.454)

Material	Category	HQ in lb (kg)
Triethanolamine Dodecylbenzenesulfonate	B	10 (4.54)
Triethylamine	C	100 (45.4)
Trimethylamine	C	100 (45.4)
Uranium Peroxide	D	500 (227)
Uranyl Acetate	D	500 (227)
Uranyl Nitrate	D	500 (227)
Uranyl Sulfate	D	500 (227)
Vanadium Pentoxide	C	100 (45.4)
Vanadyl Sulfate	C	100 (45.4)
Vinyl Acetate	C	100 (45.4)
Xylene	C	100 (45.4)
Xylenol	C	100 (45.4)
Zectran	C	100 (45.4)
Zinc Acetate	C	100 (45.4)
Zinc Ammonium Chloride	C	100 (45.4)
Zinc Bichromate	C	100 (45.4)
Zinc Borate	C	100 (45.4)
Zinc Bromide	C	100 (45.4)
Zinc Carbonate	C	100 (45.4)
Zinc Chloride	C	100 (45.4)
Zinc Cyanide	A	1 (0.454)
Zinc Fluoride	C	100 (45.4)
Zinc Formate	C	100 (45.4)
Zinc Hydrosulfite	C	100 (45.4)
Zinc Nitrate	C	100 (45.4)

Material	Category	HQ in lb (kg)
Zinc Phenolsulfonate	C	100 (45.4)
Zinc Phosphide	C	100 (45.4)
Zinc Potassium Chromate	C	100 (45.4)
Zinc Silicofluoride	C	100 (45.4)
Zinc Sulfate	C	100 (45.4)
Zinc Sulfate Monohydrate	C	100 (45.4)
Zirconium Acetate	D	500 (227)
Zirconium Nitrate	D	500 (227)
Zirconium Oxychloride	D	500 (227)
Zirconium Potassium Fluoride	D	500 (227)
Zirconium Sulfate	D	500 (227)
Zirconium Tetrachloride	D	500 (227)

ENVIRONMENTAL PROTECTION AGENCY

(FRL 472-2)

[40 CFR Part 119]

DETERMINATION OF UNITS OF MEASUREMENT AND RATES OF PENALTY FOR HAZARDOUS SUBSTANCES

Notice of Proposed Rulemaking

Notice is hereby given in accordance with 5 U.S.C. 553 that the Administrator, Environmental Protection Agency, under authority contained in Section 311(b)(2)(B)(iv) of the Federal Water Pollution Control Act Amendments of 1972, [33 U.S.C. 1251 et seq., (the Act)], proposes to create a new Part 119 of Title 40 of the Code of Federal Regulations, determining units of measurement and rates of penalty to be applied for the assessment of civil penalties under Section 311(b)(2)(B)(iii)(bb) of the Act for discharges of non-removable hazardous substances.

The Federal Water Pollution Control Act Amendments of 1972 (P.L. 92-500) amended the Federal Water Pollution Control Act (33 U.S.C. 1151 et seq.) to add a new Section 311, which provides in subsection 311(b)(2)(B)(iv) as follows:

> "The Administrator shall establish by regulation, for each hazardous substance designated under subparagraph (A) of this paragraph, and within 180 days of the date of such designation, a unit of measurement based upon the usual trade practice and, for the purpose of determining the penalty under clause (iii)(bb) of this subparagraph, shall establish for each such unit a fixed monetary amount which shall be not less than $100 nor more than $1,000 per unit. He shall establish such fixed amount based on the toxicity, degradability, and dispersal characteristics of the substance."

[FR Doc.75-34949 Filed 12-29-75;8:45 am]

This notice deals with "... hazardous substances, other than oil..." as noted in Section 311(b)(2)(A). Sections 311(b)(2)(A) and 311(b)(2)(B)(i) of the Act require that the Administrator designate hazardous substances and determine whether any such designated substance can actually be removed. Section 311(b)(4) mandates a determination of the harmful quantity of each designated substance. The designation of hazardous substances, determination of their removability, and establishment of harmful quantities are published as proposed rules concurrently with this notice as Parts 116, 117, and 118 respectively.

A. General Considerations

1. Mixtures

Section 311 specifically requires that elements and compounds be designated as hazardous substances. This has led to the development of methods for defining harmful quantities and rates of penalty based on pure compound characteristics. The presence of additional materials may affect toxicity through synergism, antagonism, addition or other interactive mechanisms. For these mixtures individual bioassays would be required to specify toxic levels of the specific mixture discharged into the specific receiving water body. Such an approach is obviously not practicable since it is not possible to predict the combinations that might be involved. It is also not feasible to designate harmful quantities and rates of penalty for all conceivable mixtures. Consequently, the approach proposed for dealing with discharges of mixtures or solutions is to assume that damages caused by individual constituents are additive. For a mixture or solution of substance X, substance Y, and substance Z, etc., the rate of penalty will be the sum of the rates for individual hazardous components if the quantity discharged equals or exceeds the harmful quantity for the mixture (40 CFR Part 118).

2. Harmful Quantities

In brief, the method selected for determination of harmful quantities involves modification of a system used in the International Convention for the Prevention of Pollution from Ships, 1973[1], by the Intergovernmental Maritime Consultative Organization (IMCO). Substances are divided into four categories on the basis of relative hazard to the environment. The smallest common commercial container size was then defined as the harmful quantity for all substances in the most toxic EPA harmful quantity category. Other categories were thereafter assigned harmful quantities on a proportional basis. If the upper aquatic toxicity limit of an EPA category was ten times higher than the upper limit of the preceeding, more toxic category, then the harmful quantity was set as ten times larger, and so forth. Further details of the categorization process may be found in the notice of proposed rulemaking for determining harmful quantities (40 CFR Part 118), published concurrently.

B. Approach for Determination of Rates of Penalty

An integral part of the penalty structure provided in Section 311 of the Act is the designation of a unit of measurement. Specifically, Section 311(b)(2)(B)(iv) requires the Administrator to establish "... a

1. Hearings before the Committee on Commerce, United States Senate, 93rd Congress, First Session, November 14, 1973, Serial No. 93-52.

unit of measurement based on the usual trade practice..." for each designated substance. This section also specifies that the civil penalties assessable under Section 311(b)(2)(B)(iii)(bb) shall fall in the range of $100-$1,000 per unit of measurement.

Agency studies involving industry and trade associations have not revealed such units common to trade practice. A common unit of measurement for the manufacturer is frequently different from that employed by the user of the same material. Furthermore, price quotations show a variety of commercial units for the same chemical. Transporters of chemicals frequently employ units different from those of either manufacturer or user. Still further variations are seen depending on the mode of transport.

In summary, the finding of the Agency is that the only common unit of measure is a weight unit, the pound. Multiples of this basic unit are utilized throughout the chemical and transportation industries, but no single multiple of the basic pound unit can be found to be representative of the usual trade practice for any chemical. The penalties using these common units of measure shall be based on the toxicity, degradability, and dispersal characteristics of the substance [Section 311(b)(2)(B)(iv)] in a manner similar to the determination of those quantities of hazardous substances which are harmful to the public health or welfare at certain times, locations, circumstances and conditions [Section 311(b)(4)]. The feature in common is the potential capacity of the substance to cause environmental damage. Therefore, the minimum quantity of each material causing probable harm can be thought of as a common unit. Thus the

weight corresponding to the smallest common commercial container size, one pound (0.454 kilogram), previously adopted as the "harmful quantity" for materials in the most toxic EPA harmful quantity category, has also been adopted as the "unit of measurement" for materials in that category and assigned a base penalty rate of $1,000 per unit. Other categories are assigned larger units of measurement which are multiples of the basic one pound unit and are found as a direct proportion between the upper aquatic toxicity limit of the less toxic category and the upper aquatic toxicity limit of Category A substances. The aquatic toxicity ranges for various hazard categories and the units of measurement derived from the appropriate ratios are found in Table 1.

TABLE 1
UNITS OF MEASUREMENT

EPA Category	Unit of Measurement lb(kg)	Representative Range
A	1 (0.454)	LC50*<1ppm
B	10 (4.54)	1 ppm ≤ LC50 < 10 ppm
C	100 (45.4)	10 ppm ≤ LC50 <100 ppm
D**	500 (227)	100 ppm ≤ LC50 ≤ 500 ppm

* LC50 means that concentration of material which is lethal to one-half of the test population of aquatic animals upon continuous exposure for 96 hours or less.

** The selection criteria (40 CFR Part 116) restrict the upper aquatic toxicity limit of the IMCO aquatic toxicity criterion from 1,000 to 500 (40 CFR Part 118), and thus alter the range used here for Category D to 100-500 ppm.

The proposed system recognizes that not all substances within a category exert their damaging effects equally. The law requires that the penalties range between $100 and $1,000 per unit of measurement. For each category in the proposed system the upper penalty limit is modified by physical/chemical adjustment factors which reflect the substance's ability to disperse.

The adjustment factor (0.1 to 1.0) arises from a second profiling operation based on the solubility, density, volatility, and associated propensity for dispersal in water of each hazardous substance. Each substance has been placed in one of eight categories combining these physical/chemical/dispersal properties in various ways. The relative harm these categories pose to the environment was then ranked. The terms involved and final relative ranking of physical/chemical/dispersal categories, in increasing order of relative damage potential, are shown in Table 2 and the the physical/chemical/dispersal factor of each substance is also indicated in Table 119.5.

TABLE 2
PHYSICAL/CHEMICAL/DISPERSAL (P/C/D) ADJUSTMENT FACTORS

Material Classification	P/C/D Category	Rank	P/C/D Factor
Insoluble Volatile Floater	IVF	1	0.10
Insoluble Nonvolatile Floater	INF	2	0.23
Insoluble Sinker	IS	3	0.36
Soluble Mixer	SM	4	0.49
Precipitator	P	5	0.62

Table 2 (Continued)

Material Classification	P/C/D Category	Rank	P/C/D Factor
Soluble Sinker	SS	6	0.75
Soluble Floater	SF	7	0.88
Miscible	M	8	1.0

Legend:

IVF (insoluble volatile floater) - materials lighter than water with a vapor pressure greater than 10 mm Hg and a solubility of less than 1,000 ppm (weight per weight basis) or materials with vapor pressure greater than 100 mm Hg and solubility less than 10,000 ppm.

INF (insoluble nonvolatile floater) - materials lighter than water with a vapor pressure less than 10 mm Hg and solubility less than 1,000 ppm (weight per weight basis).

IS (insoluble sinker) - materials heavier than water and of solubility less than 1,000 ppm (weight per weight basis).

SM (soluble mixer) - solid substances which have a solubility greater than 1000 grams of solute per 1000 grams of water.

P (precipitator) - salts which dissociate or hydrolyze in water with subsequent precipitation of a toxic ion.

SS (soluble sinker) - materials heavier than water and of solubility greater than 1,000 ppm (weight per weight basis).

SF (soluble floater) - materials lighter than water and of a solubility greater than 1,000 ppm (weight per weight basis).

M (miscible) - liquid substances which can freely mix with water in any proportion.

In summary, the adjusted rates of penalty, in dollars per unit of measurement, arising from all possible combinations of toxic category and P/C/D factor are seen in Table 3 below.

TABLE 3
RATES OF PENALTY
IN $/UNIT OF MEASUREMENT*

Category	P/C/D Classes IVF	INF	IS	SM	P	SS	SF	M
A	100	230	360	490	620	750	880	1000
B	100	230	360	490	620	750	880	1000
C	100	230	360	490	620	750	880	1000
D	100	230	360	490	620	750	880	1000

For convenience, Table 4 shows the adjusted rates of penalty, in dollars per pound, for all combinations of toxic category and P/C/D factor.

TABLE 4
RATES OF PENALTY
IN $/LB

Category	P/C/D Classes IVF	INF	IS	SM	P	SS	SF	M
A	100	230	360	490	620	750	880	1000
B	10	23	36	49	62	75	88	100
C	1.0	2.3	3.6	4.9	6.2	7.5	8.8	10
D	0.20	0.46	0.72	0.98	1.2	1.5	1.8	2.0

Prevention and mitigation of the effect of discharges are the goals of this proposed rule. The harmful effects of discharges may be reduced in many cases by such actions as warnings to affected water users, containment, treatment, appropriate final disposal of the

* Unit of measurements for categories are A = 1 lb, B = 10 lb, C = 100 lb, D = 500 lb.

discharge or debris from a clean-up operation, environmental restoration and monitoring of hazardous substance levels. Details and further suggestions may be found in the National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR Part 1510). The "General Pattern of Response Actions" has been specified in 40 CFR Part 1510.53. For those waste materials considered to be hazardous, disposal will require special precautions in addition to Guidelines published as 40 CFR Part 24. Complete documentation of response activities and plans for prevention of future discharges, in addition to providing part of the basis for civil penalties, would be most protective of the long-term interests of the public.

C. Discretionary Choice of Civil Penalty System

Section 311 provides two civil penalty systems to discourage the discharge of nonremovable hazardous substances. The decision as to which penalty system [311(b)(2)(B)(iii)] should be applied was left to the discretion of the Administrator.

Concern has been expressed that the potential economic impact of penalties which might be assessed under Section 311(b)(2)(B)(iii)(bb) could be so great that major transportation modal shifts might occur, along with changes in plant siting. The Agency has no evidence at this time which would suggest that these changes are necessary or desirable. Consultation with the Department of Transportation has suggested that available transportation expertise is being utilized but that remedial civil penalties would enhance the protection of the environment.

It is proposed that the Administrator's discretion in regard to penalties for discharges of nonremovable hazardous substances be used to control economic impact while providing strong incentive for mitigation of spill threats to public health or welfare, based upon the following principles:

1. Economic incentive in the form of penalties will motivate additional care for prevention of discharges;
2. Economic incentives in the form of penalties will motivate additional action to mitigate damages resulting from discharges;
3. Penalties should be assessed for nonremovable hazardous substances (40 CFR Part 117) discharged in amounts equal to or greater than harmful quantities (40 CFR Part 118);
4. Penalties should normally be assessed in the range of $500 to $5,000 on an individual discharge incident basis;
5. When assessing civil penalties, the substances' properties as well as the extent of action taken by the discharger to prevent or mitigate damage will be considered;
6. The higher penalty system as provided in 311(b)(2)(B)(iii)(bb) will be used only when the Agency can show gross negligence on the part of the discharger;
7. If the (bb) penalty calculates to be less than $5,000, then the (aa) penalty of $500 to $5,000 per discharge will be used;
8. Case-by-case assessment of the discharger's actions provides the most equitable penalty basis while ensuring the greatest motivation for protection of the environment.

D. Examples of Penalty Determination

1. Assume 2,000 lb. of acetic acid is spilled and that in the judgement of the responsible Federal Officer, the discharger displayed gross negligence by refusing to take mitigating actions. Therefore the civil penalty assessed is determined by the proposed penalty rate multiplied by the number of units discharged. Referring to the accompanying rates of penalty table in Part 119.5, the material is found to be in Category C. In this category, the unit of measurement is 100 pounds. The base rate of penalty is, therefore, $1,000/100 lbs. Since the P/C/D adjustment factor for acetic acid is 1.0, the final penalty rate is $1,000/100 lbs or $10/lb. The final penalty for this spill would be $10/lb x 2,000 lbs = $20,000.

2. Assume 10,000 lb of calcium oxide is spilled, but that in this case the responsible Federal Officer finds the discharger's attempts to mitigate the effects are adequate for the conditions present. Consequently, the penalty recommended to be assessed will fall in the range of $500 to $5,000 per discharge, based on the factors mentioned previously. (Note: By way of contrast, the penalty which might have been assessed in case of inadequate response or mitigation by the discharger is calculated as follows. Referring to the table of Part 119.5 one finds the material belongs to Category D with a P/C/D factor of 0.49. The base rate of penalty is $1,000/UM or $2/lb. The adjusted rate of penalty would have been 0.49 x $2/lb = $0.98/lb and the final penalty would have been $0.98/lb x 10,000 lb = $9,800.)

3. Assume 500 lb. of a solution containing 50% by weight sodium hydroxide and 50% by weight water is spilled. Further, assume that the Administrator determines that gross negligence was the cause of the spill. Only half of the total poundage spilled is a designated hazardous substance. Effectively, 250 lb have been spilled. Sodium hydroxide is a member of Category C (UM = HQ = 100 lb). The P/C/D class of the material is "SS", for which the adjustment factor is 0.75. Therefore, the rate of penalty is 0.75 x $1,000/UM = $750/UM or 0.75 x $10/lb = $7.50/lb and the penalty would equal $7.50/lb x 250 lb = $1,875. However, for those spills in quantities leading to a total penalty of less than $5,000 under the penalty rate scheme of 311(b)(2)(B)(iii)(bb), the Administrator will assess a penalty in the range of $500 to $5,000 per discharge event according to the guidelines given earlier.

Interested persons may participate in this rulemaking by submitting written comments or requests for information, in triplicate, to: Dr. C. Hugh Thompson, WH-595, U.S. Environmental Protection Agency, Washington, D.C. 20460.

The Agency is particularly interested in comments relative to:

1). Effectiveness of the penalty rates in encouraging prevention and damage mitigation measures;

2). The use and magnitude of physical/chemical/dispersal factors;

3). The potential impact of penalty rates on producers, transporters, and handlers of hazardous substances;

4). The general workability of the proposed regulation guidelines for penalty rate discretion by the Administrator. The use of gross negligence as the prime basis for the Administrator's discretion was necessary to implement this section of the Act, due to the inflexibility of both the 311(b)(2)(B)(iii)(bb) upper penalty limits and the 311(b)(2)(B)(iv) penalty rate structure.

All comments received on or before 60 calendar days after the date of this publication will be considered before taking further action on the proposed rule.

A copy of all comments will be available for inspection and copying at the U.S. Environmental Protection Agency, Public Information Reference Unit, Room 2922 (EPA Library), 401 M Street, S.W., Washington, D.C. 20460. The Environmental Protection Agency information regulation, 40 CFR Part 2, provides that a reasonable fee may be charged for copying.

Executive Order 11821 (November 27, 1974) requires that major proposals for legislation and promulgation of regulations and rules by agencies of the Executive Branch be accompanied by a statement certifying that the inflationary impact of the proposal has been evaluated.

A number of criteria have been defined to determine which actions require an inflationary impact statement. The Agency's analysis of the potential economic impact of these regulations indicate that none of the criteria defining a major proposal have been met. Thus, it is hereby certified that the economic and inflationary effects of this proposal have

been carefully evaluated in accordance with Executive Order 11821 and that no inflationary impact statement is required.

/s/ Russell E. Train

Russell E. Train
Administrator

Dated: DEC 22 1975

CERTIFIED TO BE A TRUE COPY OF THE ORIGINAL DOCUMENT,

Part 119 - DETERMINATION OF UNITS OF MEASUREMENT AND RATES OF PENALTY FOR HAZARDOUS SUBSTANCES

119.1 Applicability
119.2 Abbreviations
119.3 Definitions
119.4 Guidelines for Discretionary Choice for Rate of Penalty
119.5 Determination of Units of Measurement and Rates of Penalty

Authority: Sections 311(b)(2)(B)(iv) and 501(a) of the Federal Water Pollution Control Act Amendments of 1972, [33 U.S.C. 1251 et seq., (the Act)].

119.1 APPLICABILITY

The regulation of this part makes a determination of the Units of Measurement and Rates of Penalty appropriate for discharges of non-removable hazardous substances (40 CFR Parts 116 and 117) in quantities equal to or exceeding the Harmful Quantity, (40 CFR Part 118). This regulation applies to designated substances in quantities equal to or in excess of those set forth in 40 CFR Part 118 when discharged into navigable waters or adjoining shorelines or the waters of the contiguous zone from vessels and offshore or onshore facilities except when the owner or operator can show such discharges are made: (1) in compliance with the requirements of Sections 301, 302, 304, 306, 307, and in compliance with an NPDES permit which has been issued pursuant to Section 402 of the Act, (2) in compliance with permits issued under Section 404 of the Act or Sections 102 and 103 of the Marine Protection, Research, and Sanctuaries Act of 1972 (33 U.S.C. 1401 et seq.), (3) in compliance with approved water treatment plant operations as specified by local, State or Federal health regulations pertaining to safe drinking water,

(4) from properly functioning marine sanitation flow-through devices certified by the United States Coast Guard pursuant to Section 312 of the Act, or (5) in the course of a permitted use of a pesticide registered under 40 CFR Part 162 (Federal Register, Vol. 40, No. 129, Part II, pp. 28242-28286, July 3, 1975) by authority of the Federal Insecticide, Fungicide, and Rodenticide Act, as amended by the Federal Environmental Pesticide Control Act of 1972, (86 Stat. 973, P.L. 92-516, 7 U.S.C. 136 et seq.).

119.2 ABBREVIATIONS

lb = pound(s)

kg = kilogram(s)

HQ = harmful quantity as required by Section 311(b)(4) and specified in 40 CFR Part 118

UM = unit of measurement as required by Section 311(b)(2)(B)(iv)

ROP = rate of penalty as required by Section 311(b)(2)(B)(iv)

119.3 DEFINITIONS

As used in this part, all terms shall have the same meaning in Section 311 of the Act and in 40 CFR Parts 116, 117, and 118.

119.4 GUIDELINES FOR DISCRETIONARY CHOICE OF RATE OF PENALTY

Prevention or mitigation and minimization of damage to public health or welfare resulting from discharges of nonremovable hazardous substances are encouraged by use of the following penalty system:

119.4a

Penalties will be assessed based upon the substance's toxicity,

degradability, dispersal characteristics and the mitigating steps taken in the event of discharges of nonremovable hazardous substances in excess of the harmful quantity (40 CFR Part 118) at the rate of $500 to $5,000 per discharge, by use of Section 311(b)(2)(B)(iii)(aa), unless the Administrator determines that gross negligence on the part of the owner or operator of the vessel or facility is the cause of the discharge, or that after the discharge has occurred, the owner or operator has displayed gross negligence in minimizing or mitigating effects on the public health or welfare.

119.4b

When gross negligence is determined as in 119.4a, the Administrator will assess penalties for discharge of a nonremovable hazardous substance in excess of the harmful quantity using Section 311(b)(2)(B)(iii)(bb) and a rate of penalty per unit of measurement as set forth in Section 119.5 of this part, unless the total penalty assessed under this part is $5,000 or less; then a penalty on a "per discharge" basis, as noted in 119.4a will be used.

119.5 DETERMINATION OF UNITS OF MEASUREMENT AND RATES OF PENALTY

In accordance with Section 311(b)(2)(B)(iv) of the Act, the base penalty rate is determined for each category to be $1,000 per unit of measurement. The penalty rate for each substance is found by multiplication of the base penalty rate by an adjustment factor (a "P/C/D factor" which ranges from 0.1 to 1.0) reflecting the solubility, density, volatility, and associated propensity for dispersal in water of each hazardous substance, which thus satisfies the requirement that the penalty rate vary between $100 and $1,000 per unit of measurement.

For discharges of mixtures or solutions, the rate of penalty will be the sum of the rates for individual hazardous components if the quantity discharged equals or exceeds the harmful quantity for the mixture (determined by procedures in 40 CFR Part 118).

The following table lists each designated hazardous substance on the same line with the assigned EPA category, the corresponding unit of measurement (and harmful quantity), the assigned physical/chemical/dispersal (P/C/D) adjustment factor and the rate of penalty in dollars per unit of measurement. For convenience and understanding, the units of measurement have been used to calculate the penalty rates in dollars per pound as shown in the right hand column of Table 119.5.

Table 119.5: EPA HARMFUL QUANTITY CATEGORIES, UNITS OF MEASUREMENT AND RATES OF PENALTY

Material	EPA Category	UM in lb (kg)	P/C/D Factor	ROP ($/UM)	ROP ($/lb)
Acetaldehyde	C	100 (45.4)	1.0	1,000	10
Acetic Acid	C	100 (45.4)	1.0	1,000	10
Acetic Anhydride	C	100 (45.4)	0.88	880	8.8
Acetone Cyanohydrin	C	100 (45.4)	0.88	880	8.8
Acetyl Bromide	D	500 (227)	0.75	750	1.5
Acetyl Chloride	D	500 (227)	0.75	750	1.5
Acrolein	A	1 (0.454)	0.88	880	880
Acrylonitrile	C	100 (45.4)	0.88	880	8.8
Adiponitrile	D	500 (227)	0.88	880	1.8
Aldrin	A	1 (0.454)	0.36	360	360
Allyl Alcohol	B	10 (4.54)	1.0	1,000	100
Allyl Chloride	C	100 (45.4)	0.10	100	1.0
Aluminum Fluoride	D	500 (227)	0.62	620	1.2
Aluminum Sulfate	D	500 (227)	0.62	620	1.2
Ammonia	C	100 (45.4)	0.88	880	8.8
Ammonium Acetate	D	500 (227)	0.49	490	0.98

Material	EPA Category	UM in lb (kg)	P/C/D Factor	ROP ($/UM)	ROP ($/lb)
Ammonium Benzoate	D	500 (227)	0.75	750	1.5
Ammonium Bicarbonate	D	500 (227)	0.75	750	1.5
Ammonium Bichromate	D	500 (227)	0.75	750	1.5
Ammonium Bifluoride	D	500 (227)	0.75	750	1.5
Ammonium Bisulfite	D	500 (227)	0.75	750	1.5
Ammonium Bromide	D	500 (227)	0.75	750	1.5
Ammonium Carbamate	D	500 (227)	0.75	750	1.5
Ammonium Carbonate	D	500 (227)	0.49	490	0.98
Ammonium Chloride	D	500 (227)	0.75	750	1.5
Ammonium Chromate	D	500 (227)	0.75	750	1.5
Ammonium Citrate	D	500 (227)	0.75	750	1.5
Ammonium Fluoborate	D	500 (227)	0.75	750	1.5
Ammonium Fluoride	D	500 (227)	0.49	490	0.98
Ammonium Hydroxide	C	100 (45.4)	1.0	1,000	10
Ammonium Hypophosphite	D	500 (227)	0.75	750	1.5
Ammonium Iodide	D	500 (227)	0.49	490	0.98
Ammonium Nitrate	D	500 (227)	0.49	490	0.98

Material	EPA Category	UM in lb (kg)	P/C/D Factor	ROP ($/UM)	ROP ($/lb)
Ammonium Oxalate	D	500 (227)	0.75	750	1.5
Ammonium Pentaborate	D	500 (227)	0.75	750	1.5
Ammonium Persulfate	D	500 (227)	0.75	750	1.5
Ammonium Silicofluoride	C	100 (45.4)	0.75	750	7.5
Ammonium Sulfamate	D	500 (227)	0.49	490	0.98
Ammonium Sulfide	D	500 (227)	0.75	750	1.5
Ammonium Sulfite	D	500 (227)	0.75	750	1.5
Ammonium Tartrate	D	500 (227)	0.75	750	1.5
Ammonium Thiocyanate	D	500 (227)	0.49	490	0.98
Ammonium Thiosulfate	D	500 (227)	0.49	490	0.98
Amyl Acetate	C	100 (45.4)	0.23	230	2.3
Aniline	C	100 (45.4)	0.75	750	7.5
Antimony Pentachloride	C	100 (45.4)	0.62	620	6.2
Antimony Pentafluoride	C	100 (45.4)	0.62	620	6.2
Antimony Potassium Tartrate	C	100 (45.4)	0.62	620	6.2
Antimony Tribromide	C	100 (45.4)	0.62	620	6.2
Antimony Trichloride	C	100 (45.4)	0.62	620	6.2

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Material	EPA Category	UM in lb (kg)	P/C/D Factor	ROP ($/UM)	ROP ($/lb)
Antimony Trifluoride	C	100 (45.4)	0.62	620	6.2
Antimony Trioxide	C	100 (45.4)	0.62	620	6.2
Arsenic Acid	C	100 (45.4)	0.62	620	6.2
Arsenic Disulfide	C	100 (45.4)	0.36	360	3.6
Arsenic Pentoxide	B	10 (4.54)	0.62	620	62
Arsenic Trichloride	C	100 (45.4)	0.62	620	6.2
Arsenic Trioxide	B	10 (4.54)	0.62	620	62
Arsenic Trisulfide	B	10 (4.54)	0.36	360	36
Barium Cyanide	A	1 (0.454)	0.75	750	750
Benzene	C	100 (45.4)	0.10	100	1.0
Benzoic Acid	D	500 (227)	0.75	750	1.5
Benzonitrile	C	100 (45.4)	0.75	750	7.5
Benzoyl Chloride	D	500 (227)	0.75	750	1.5
Benzyl Chloride	D	500 (227)	0.36	360	0.72
Beryllium Chloride	D	500 (227)	0.62	620	1.2
Beryllium Fluoride	C	100 (45.4)	0.62	620	6.2
Beryllium Nitrate	C	100 (45.4)	0.62	620	6.2

Material	EPA Category	UM in lb (kg)	P/C/D Factor	ROP ($/UM)	ROP ($/lb)
Butyl Acetate	C	100 (45.4)	0.88	880	8.8
Butylamine	C	100 (45.4)	1.0	1,000	10
Butyric Acid	D	500 (227)	1.0	1,000	2.0
Cadmium Acetate	A	1 (0.454)	0.75	750	750
Cadmium Bromide	A	1 (0.454)	0.62	620	620
Cadmium Chloride	A	1 (0.454)	0.62	620	620
Calcium Arsenate	C	100 (45.4)	0.36	360	3.6
Calcium Arsenite	C	100 (45.4)	0.75	750	7.5
Calcium Carbide	D	500 (227)	0.62	620	1.2
Calcium Chromate	D	500 (227)	0.75	750	1.5
Calcium Cyanide	A	1 (0.454)	0.75	750	750
Calcium Dodecylbenzene-sulfonate	B	10 (4.54)	0.75	750	75
Calcium Hydroxide	D	500 (227)	0.75	750	1.5
Calcium Hypochlorite	A	1 (0.454)	0.49	490	490
Calcium Oxide	D	500 (227)	0.49	490	0.98
Captan	A	1 (0.454)	0.75	750	750

Material	EPA Category	UM in lb (kg)	P/C/D Factor	ROP ($/UM)	ROP ($/lb)
Carbaryl	B	10 (4.54)	0.75	750	75
Carbon Disulfide	C	100 (45.4)	0.75	750	7.5
Chlordane	A	1 (0.454)	0.36	360	360
Chlorine	A	1 (0.454)	0.88	880	880
Chlorobenzene	B	10 (4.54)	0.36	360	36
Chloroform	B	10 (4.54)	0.36	360	36
Chlorosulfonic Acid	C	100 (45.4)	0.75	750	7.5
Chromic Acetate	D	500 (227)	0.75	750	1.5
Chromic Acid	D	500 (227)	0.49	490	0.98
Chromic Sulfate	D	500 (227)	0.75	750	1.5
Chromous Chloride	D	500 (227)	0.36	360	0.7
Chromyl Chloride	D	500 (227)	0.75	750	1.5
Cobaltous Bromide	C	100 (45.4)	0.62	620	6.2
Cobaltous Fluoride	C	100 (45.4)	0.62	620	6.2
Cobaltous Formate	C	100 (45.4)	0.62	620	6.2
Cobaltous Sulfamate	C	100 (45.4)	0.62	620	6.2
Coumaphos	A	1 (0.454)	0.75	750	750

Material	EPA Category	UM in lb (kg)	P/C/D Factor	ROP ($/UM)	ROP ($/lb)
Cresol	B	10 (4.54)	0.75	750	75
Cupric Acetate	B	10 (4.54)	0.62	620	62
Cupric Acetoarsenite	B	10 (4.54)	0.36	360	36
Cupric Chloride	B	10 (4.54)	0.62	620	62
Cupric Formate	B	10 (4.54)	0.62	620	62
Cupric Glycinate	B	10 (4.54)	0.62	620	62
Cupric Lactate	B	10 (4.54)	0.62	620	62
Cupric Nitrate	B	10 (4.54)	0.62	620	62
Cupric Oxalate	B	10 (4.54)	0.36	360	36
Cupric Subacetate	B	10 (4.54)	0.62	620	62
Cupric Sulfate	B	10 (4.54)	0.62	620	62
Cupric Sulfate Ammoniated	B	10 (4.54)	0.62	620	62
Cupric Tartrate	B	10 (4.54)	0.36	360	36
Cuprous Bromide	B	10 (4.54)	0.36	360	36
Cyanogen Chloride	A	1 (0.454)	0.75	750	750
Cyclohexane	C	100 (45.4)	0.10	100	1.0
2, 4-D Acid	B	10 (4.54)	0.36	360	36

Material	EPA Category	UM in lb (kg)	P/C/D Factor	ROP ($/UM)	ROP ($/lb)
2, 4-D Esters	B	10 (4.54)	0.36	360	36
Dalapon	B	10 (4.54)	0.75	750	75
DDT	A	1 (0.454)	0.36	360	360
Diazinon	A	1 (0.454)	0.36	360	360
Dicamba	C	100 (45.4)	0.75	750	7.5
Dichlobenil	C	100 (45.4)	0.75	750	7.5
Dichlone	A	1 (0.454)	0.75	750	750
Dichlorvos	A	1 (0.454)	0.75	750	750
Dieldrin	A	1 (0.454)	0.75	750	750
Diethylamine	C	100 (45.4)	0.88	880	8.8
Dimethylamine	C	100 (45.4)	0.88	880	8.8
Dinitrobenzene	C	100 (45.4)	0.75	750	7.5
Dinitrophenol	B	10 (4.54)	0.75	750	75
Diquat	C	100 (45.4)	0.75	750	7.5
Disulfoton	A	1 (0.454)	0.75	750	750
Diuron	B	10 (4.54)	0.75	750	75
Dodecylbenzenesulfonic Acid	B	10 (4.54)	0.75	750	75

Material	EPA Category	UM in lb (kg)	P/C/D Factor	ROP ($/UM)	ROP ($/lb)
Dursban	A	1 (0.454)	0.75	750	750
Endosulfan	A	1 (0.454)	0.75	750	750
Endrin	A	1 (0.454)	0.36	360	360
Ethion	A	1 (0.454)	0.75	750	750
Ethylbenzene	C	100 (45.4)	0.23	230	2.3
Ethylenediamine	C	100 (45.4)	0.88	880	8.8
EDTA	D	500 (227)	0.36	360	0.72
Ferric Ammonium Citrate	C	100 (45.4)	0.62	620	6.2
Ferric Ammonium Oxalate	C	100 (45.4)	0.62	620	6.2
Ferric Chloride	C	100 (45.4)	0.62	620	6.2
Ferric Fluoride	C	100 (45.4)	0.62	620	6.2
Ferric Nitrate	C	100 (45.4)	0.62	620	6.2
Ferric Sulfate	C	100 (45.4)	0.62	620	6.2
Ferrous Ammonium Sulfate	C	100 (45.4)	0.62	620	6.2
Ferrous Chloride	C	100 (45.4)	0.62	620	6.2
Ferrous Sulfate	C	100 (45.4)	0.62	620	6.2
Formaldehyde	C	100 (45.4)	1.0	1,000	10

Material	EPA Category	UM in lb (kg)	P/C/D Factor	ROP ($/UM)	ROP ($/lb)
Formic Acid	C	100 (45.4)	1.0	1,000	10
Fumaric Acid	D	500 (227)	0.75	750	1.5
Furfural	C	100 (45.4)	0.75	750	7.5
Guthion	A	1 (0.454)	0.36	360	360
Heptachlor	A	1 (0.454)	0.36	360	360
Hydrochloric Acid	D	500 (227)	0.75	750	1.5
Hydrofluoric Acid	D	500 (227)	1.0	1,000	2.0
Hydrogen Cyanide	A	1 (0.454)	1.0	1,000	1,000
Hydroxylamine	D	500 (227)	0.75	750	1.5
Isoprene	C	100 (45.4)	0.10	100	1.0
Isopropanolamine Dodecyl-benzenesulfonate	B	10 (4.54)	0.75	750	75
Kelthane	C	100 (45.4)	0.36	360	3.6
Lead Acetate	D	500 (227)	0.62	620	1.2
Lead Arsenate	D	500 (227)	0.36	360	0.7
Lead Chloride	D	500 (227)	0.62	620	1.2
Lead Fluoborate	D	500 (227)	0.62	620	1.2
Lead Fluoride	C	100 (45.4)	0.36	360	3.6

Material	EPA Category	UM in lb (kg)	P/C/D Factor	ROP ($/UM)	ROP ($/lb)
Lead Iodide	D	500 (227)	0.36	360	0.7
Lead Nitrate	D	500 (227)	0.62	620	1.2
Lead Stearate	D	500 (227)	0.62	620	1.2
Lead Sulfate	D	500 (227)	0.36	360	0.7
Lead Sulfide	C	100 (45.4)	0.36	360	3.6
Lead Tetraacetate	D	500 (227)	0.62	620	1.2
Lead Thiocyanate	D	500 (227)	0.36	360	0.7
Lead Thiosulfate	D	500 (227)	0.36	360	0.7
Lead Tungstate	D	500 (227)	0.36	360	0.7
Lindane	A	1 (0.454)	0.75	750	750
Lithium Bichromate	D	500 (227)	0.49	490	0.98
Lithium Chromate	D	500 (227)	0.49	490	0.98
Malathion	A	1 (0.454)	0.75	750	750
Maleic Acid	D	500 (227)	0.75	750	1.5
Maleic Anhydride	D	500 (227)	0.88	880	1.8
Mercuric Acetate	A	1 (0.454)	0.62	620	620
Mercuric Cyanide	A	1 (0.454)	0.62	620	620

Material	EPA Category	UM in lb (kg)	P/C/D Factor	ROP ($/UM)	ROP ($/lb)
Mercuric Nitrate	A	1 (0.454)	0.62	620	620
Mercuric Sulfate	A	1 (0.454)	0.62	620	620
Mercuric Thiocyanate	A	1 (0.454)	0.36	360	360
Mercurous Nitrate	A	1 (0.454)	0.62	620	620
Methoxychlor	A	1 (0.454)	0.36	360	360
Methyl Mercaptan	B	10 (4.54)	0.10	100	10
Methyl Methacrylate	D	500 (227)	0.10	100	0.2
Methyl Parathion	B	10 (4.54)	0.36	360	36
Mevinphos	A	1 (0.454)	1.0	1,000	1,000
Monoethylamine	C	100 (45.4)	1.0	1,000	10
Monomethylamine	C	100 (45.4)	0.88	880	8.8
Naled	A	1 (0.454)	0.36	360	360
Naphthalene	B	10 (4.54)	0.36	360	36
Naphthenic Acid	A	1 (0.454)	0.75	750	750
Nickel Ammonium Sulfate	D	500 (227)	0.62	620	1.2
Nickel Chloride	D	500 (227)	0.62	620	1.2
Nickel Formate	C	100 (45.4)	0.62	620	6.2

Material	EPA Category	UM in lb (kg)	P/C/D Factor	ROP ($/UM)	ROP ($/lb)
Nickel Hydroxide	C	100 (45.4)	0.36	360	3.6
Nickel Nitrate	D	500 (227)	0.62	620	1.2
Nickel Sulfate	D	500 (227)	0.62	620	1.2
Nitric Acid	C	100 (45.4)	1.0	1,000	10
Nitrobenzene	D	500 (227)	0.75	750	1.5
Nitrogen Dioxide	C	100 (45.4)	1.0	1,000	10
Nitrophenol	B	10 (4.54)	0.75	750	75
Paraformaldehyde	C	100 (45.4)	0.75	750	7.5
Parathion	A	1 (0.454)	0.36	360	360
Pentachlorophenol	A	1 (0.454)	0.36	360	360
Phenol	B	10 (4.54)	0.75	750	75
Phosgene	D	500 (227)	0.75	750	1.5
Phosphoric Acid	D	500 (227)	1.0	1,000	2.0
Phosphorous	A	1 (0.454)	0.36	360	360
Phosphorous Oxychloride	D	500 (227)	0.75	750	1.5
Phosphorous Pentasulfide	C	100 (45.4)	0.75	750	7.5
Phosphorous Trichloride	D	500 (227)	0.75	750	1.5

Material	EPA Category	UM in lb (kg)	P/C/D Factor	ROP ($/UM)	ROP ($/lb)
Polychlorinated Biphenyls	A	1 (0.454)	0.36	360	360
Potassium Arsenate	C	100 (45.4)	0.62	620	6.2
Potassium Arsenite	C	100 (45.4)	0.62	620	6.2
Potassium Bichromate	D	500 (227)	0.75	750	1.5
Potassium Chromate	D	500 (227)	0.75	750	1.5
Potassium Cyanide	A	1 (0.454)	0.75	750	750
Potassium Hydroxide	C	100 (45.4)	0.49	490	4.9
Potassium Permanganate	B	10 (4.54)	0.75	750	75
Propionic Acid	D	500 (227)	1.0	1,000	2.0
Propionic Anhydride	D	500 (227)	1.0	1,000	2.0
Propyl Alcohol	D	500 (227)	1.0	1,000	2.0
Pyrethrins	C	100 (45.4)	0.75	750	7.5
Quinoline	A	1 (0.454)	0.75	750	750
Resorcinol	B	10 (4.54)	0.75	750	75
Selenium Oxide	C	100 (45.4)	0.75	750	7.5
Sodium	C	100 (45.4)	0.75	750	7.5
Sodium Arsenate	C	100 (45.4)	0.75	750	7.5

Material	EPA Category	UM in lb (kg)	P/C/D Factor	ROP ($/UM)	ROP ($/lb)
Sodium Arsenite	C	100 (45.4)	0.75	750	7.5
Sodium Bichromate	D	500 (227)	0.49	490	0.98
Sodium Bifluoride	D	500 (227)	0.75	750	1.5
Sodium Bisulfite	D	500 (227)	0.75	750	1.5
Sodium Chromate	D	500 (227)	0.75	750	1.5
Sodium Cyanide	A	1 (0.454)	0.75	750	750
Sodium Dodecylbenzene-sulfonate	B	10 (4.54)	0.75	750	75
Sodium Fluoride	D	500 (227)	0.75	750	1.5
Sodium Hydrosulfide	D	500 (227)	0.75	750	1.5
Sodium Hydroxide	C	100 (45.4)	0.75	750	7.5
Sodium Hypochlorite	A	1 (0.454)	0.49	490	490
Sodium Methylate	C	100 (45.4)	0.75	750	7.5
Sodium Nitrite	B	10 (4.54)	0.75	750	75
Sodium Phosphate Monobasic	D	500 (227)	0.75	750	1.5
Sodium Phosphate Dibasic	D	500 (227)	0.49	490	0.98
Sodium Phosphate Tribasic	D	500 (227)	0.75	750	1.5
Sodium Selenite	C	100 (45.4)	0.75	750	7.5

Material	EPA Category	UM in lb (kg)	P/C/D Factor	ROP ($/UM)	ROP ($/lb)
Sodium Sulfide	C	100 (45.4)	0.75	750	7.5
Stannous Fluoride	D	500 (227)	0.75	750	1.5
Strontium Chromate	D	500 (227)	0.36	360	0.72
Strychnine	C	100 (45.4)	0.36	360	3.6
Styrene	C	100 (45.4)	0.10	100	1.0
Sulfuric Acid	C	100 (45.4)	1.0	1,000	10
Sulfur Monochloride	D	500 (227)	0.75	750	1.5
2,4,5-T Acid	A	1 (0.454)	0.36	360	360
2,4,5-T Esters	A	1 (0.454)	0.36	360	360
TDE	A	1 (0.454)	0.36	360	360
Tetraethyl Lead	A	1 (0.454)	0.36	360	360
Tetraethyl Pyrophosphate	B	10 (45.4)	1.0	1,000	100
Toluene	C	100 (45.4)	0.10	100	1.0
Toxaphene	A	1 (0.454)	0.36	360	360
Trichlorfon	B	10 (4.54)	0.75	750	7.5
Trichlorophenol	A	1 (0.454)	0.36	360	360
Triethanolamine Dodecylbenzenesulfonate	B	10 (4.54)	0.75	750	75

Material	EPA Category	UM in lb (kg)	P/C/D Factor	ROP ($/UM)	ROP ($/lb)
Triethylamine	C	100 (45.4)	0.88	880	8.8
Trimethylamine	C	100 (45.4)	0.88	880	8.8
Uranium Peroxide	D	500 (227)	0.36	360	0.7
Uranyl Acetate	D	500 (227)	0.62	620	1.2
Uranyl Nitrate	D	500 (227)	0.62	620	1.2
Uranyl Sulfate	D	500 (227)	0.62	620	1.2
Vanadium Pentoxide	C	100 (45.4)	0.62	620	6.2
Vanadyl Sulfate	C	100 (45.4)	0.62	620	6.2
Vinyl Acetate	C	100 (45.4)	0.88	880	8.8
Xylene	C	100 (45.4)	0.23	230	2.3
Xylenol	C	100 (45.4)	0.75	750	7.5
Zectran	C	100 (45.4)	0.75	750	7.5
Zinc Acetate	C	100 (45.4)	0.62	620	6.2
Zinc Ammonium Chloride	C	100 (45.4)	0.62	620	6.2
Zinc Bichromate	C	100 (45.4)	0.62	620	6.2
Zinc Borate	C	100 (45.4)	0.62	620	6.2
Zinc Bromide	C	100 (45.4)	0.62	620	6.2

Material	EPA Category	UM in lb (kg)	P/C/D Factor	ROP ($/UM)	ROP ($/lb)
Zinc Carbonate	C	100 (45.4)	0.36	360	3.6
Zinc Chloride	C	100 (45.4)	0.62	620	6.2
Zinc Cyanide	A	1 (0.454)	0.36	360	360
Zinc Fluoride	C	100 (45.4)	0.62	620	6.2
Zinc Formate	C	100 (45.4)	0.62	620	6.2
Zinc Hydrosulfite	C	100 (45.4)	0.62	620	6.2
Zinc Nitrate	C	100 (45.4)	0.62	620	6.2
Zinc Phenolsulfonate	C	100 (45.4)	0.62	620	6.2
Zinc Phosphide	C	100 (45.4)	0.36	360	3.6
Zinc Potassium Chromate	C	100 (45.4)	0.36	360	3.6
Zinc Silicofluoride	C	100 (45.4)	0.62	620	6.2
Zinc Sulfate	C	100 (45.4)	0.62	620	6.2
Zinc Sulfate Monohydrate	C	100 (45.4)	0.62	620	6.2
Zirconium Acetate	D	500 (227)	0.62	620	1.2
Zirconium Nitrate	D	500 (227)	0.62	620	1.2
Zirconium Oxychloride	D	500 (227)	0.62	620	1.2
Zirconium Potassium Fluoride	D	500 (227)	0.62	620	1.2
Zirconium Sulfate	D	500 (227)	0.62	620	1.2
Zirconium Tetrachloride	D	500 (227)	0.62	620	1.2

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